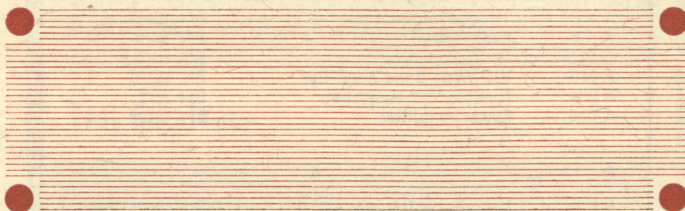


**ROHDE &
SCHWARZ**
MEASURING INSTRUMENTS



PLEASE RETURN TO:



LAUB ENGINEERING
SKOKIE, ILLINOIS
BOX 492 — TEL.: 679-4172

ROHDE & SCHWARZ - TEST EQUIPMENT CATALOGUE


Please note that this catalogue comprises the R&S measuring instruments, their auxiliary units and accessories.

For the Index by Instrument Type please refer to the next page. If you are not familiar with the R&S type designations the Quick Index (next page but one), which lists the instruments according to their general function, will be helpful to you.

If you wish to obtain additional information on a particular measuring instrument you are invited to contact your nearest distributor, who is named below. He represents our firm in your country and will be glad to answer your questions, regardless of whether they concern technical problems or prices and delivery times. Your orders will take a short cut if you address them to "your" distributor and if you specify your requirements accurately. Please, always state the name of the measuring instrument desired, the type designation and the order number. This order number is of particular importance inasmuch as it often identifies different versions of an instrument. For the most rapid service also contact "your" distributor. Finally, "your" distributor will readily help you solve your measurement problems. Naturally, the engineers of our head office in Munich will always be pleased to offer you any advice and assistance you may require.

★ Instruments in this catalogue which are marked with this asterisk are not yet in the stage of quantity production.

⚡ Instruments with this sign are AC-supply operated and can generally be adapted to 115/125/220/235 v at 47 to 63 cps.

 TEST ASSEMBLY FOR MEASURING AND RECORDING THE FIELD STRENGTH IN THE UHF RANGE consisting of UHF Field-Strength Measuring Equipment Type HFA and DC Recorder Type ZSG.

"YOUR" DISTRIBUTOR IS:

ROHDE & SCHWARZ, Sales Co. (USA) Inc.
P. O. Box 275
111 LEXINGTON AVE.
PASSAIC, New Jersey
Telephone Prescott 3-8010

R&S MEASURING INSTRUMENTS - INDEX BY INSTRUMENT TYPE

* An asterisk indicates that there are several models of this type. In this case only the lowest Order Number is listed.

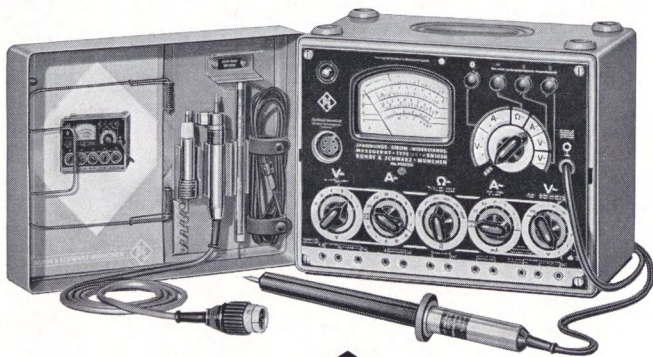
Type	Designation	Order No.	Page	Type	Designation	Order No.	Page
A							
ABF	TV Modulation Amplifier	BN 13711	7	LDN	Decade Inductor	BN 6310*	33
ABR	Peak Limiter	BN 1601	7	LMC	SHF Non-Slotted Line	BN 3931/50*	16
AMF	TV Demodulator	BN 46421*	9	LMD	UHF Slotted Line	BN 3926/50*	16
ANT	VLF Wide-Band Amplifier	BN 13140	7	LMM	VHF Slotted Line	BN 3916/50*	16
ASV	Tunable VHF Amplifier	BN 1372	7				
ATN	Power Amplifier	BN 13193	7	M			
B				MAD	UHF AM Modulator	BN 4191/50*	20
BSI	Impedance Transformer	BN 90634/200*	34	MSF	Prec. Blanking & Sync Signal Mixer	BN 4194	21
BSU	Broadband Balun	BN 90610/50*	34	N			
C				NAD	UHF Wattmeter & Matching Indic.	BN 26213/50*	10
CAA	Standard Time System	BN 78011*	25	NAF	Directional Coupler	BN 464113*	9
CAK	Rhythmic Signal Panel	BN 7821	25	NAK	VHF Wattmeter & Matching Indic.	BN 26013/50*	10
CAO	Time Signal Oscillograph	BN 7811	25	NAN	HF Wattmeter & Matching Indic.	BN 260053/50*	10
CAQ	Frequency and Time Standard	BN 7850	25	NAU	UHF Wattmeter & Matching Indic.	BN 26113/50*	10
CAS	Sidereal Time Converter	BN 7820	25	NGN	Low-Voltage Power Supply	BN 95143	33
CAZ	Programme Contactor	BN 7830	25	NGS	Klystron Power Supply	BN 95147	33
CBA	Astronomical Clock System	BN 78013*	25	NGU	Laboratory Power Supply	BN 95140	33
D				NM 674/4	Sound Transmitter Test Assembly	—	8
DAF	Matching Pad	BN 18083*	34	NRD	Microwave Power Meter	BN 2412/50*	9
DLK	Adjustable Delay Line	BN 17920	12	O			
DPCV	Variable Flap Attenuator	BN 180811/137*	12	OHF	VF-RF Level Oscilloscope	BN 19131*	30
DPF	UHF Attenuator	BN 18060/50*	12	OMF	Precision Oscilloscope	BN 1912	30
DPR	Standard Attenuator	BN 18014/60*	12	P			
DPV	UHF Standard Attenuator	BN 18043/50*	12	PBA	Switchable UHF Bandpass Filter	BN 49141	6
E				PBO	Octave Filter	BN 4920	29
EBL	Vibrotest (Acceleration Meter)	BN 4531	28	PBS	Sone Filter	BN 4930	28
EBV	Vibration Meter	BN 4521/3	28	PDF	Phase & Level Meter	BN 19450	16
EBVA	Adapter for EBVB	BN 45121	29	PZN	Phase Meter	BN 1941	16
EBVB	Acceleration Pickup	BN 452111*	29	Q			
EBVT	Acceleration Calibrator	BN 45217	28	QVH	Q Meter	BN 3672	15
ESG	VHF Receiver	BN 15075	4	R			
ESM 180	VHF Monitoring Receiver 30/180	BN 15073/2	4	RBC	Waveguide Load Resistor	BN 334011/137*	11
ESM 300	VHF Monitoring Receiver 85/300	BN 15074/2	4	RBD	UHF Load Resistor	BN 33661/50*	11
ESU	VHF-UHF Mon. Rec. (basic model)	BN 150021	6	RC 040/50	UHF-SHF Load Resistor	—*	11
EZGN	Sound Level Meter	BN 4503	29	RC 1/50	UHF-SHF Load Resistor	—*	11
EZLT	Sound Level Meter	BN 4513	29	RC 10/50	UHF Load Resistor	—*	11
EZS	Radio Interference Indicator	BN 15131	4	RD 010/50	UHF Load Resistor	—*	11
F				RD 1/50	UHF Load Resistor	—*	11
FKM	Frequency Indicator	BN 47051	23	RD 3/50	UHF Load Resistor	—*	11
FMV	Frequency Deviation Meter	BN 4620	8	RD 10/50	UHF Load Resistor	—*	11
FNA	Audio-Frequency Spectrograph	BN 48301	26	RG M	Calibrated Decade Resistor	BN 332	11
FTA	AF Wave Analyzer	BN 48302	26	RGN	Calibrated Decade Resistor	BN 331	11
FTK	Frequency Indicator	BN 4700	22	RGV	Precision Resistance Meter	BN 340	13
FTZ	Direct-Reading Distortion Meter	BN 4816	26	RMC	SHF Standard Resistor	BN 33527/50*	11
FZN	Mains Frequency Indicator	BN 47092*	23	RSP	Impedance Meter	BN 3540	13
H				S			
HFA	UHF Field-Strength Meas. Equipment	BN 15003	6	SAR	SHF Signal Generator	BN 41029/50*	18
HFH	Field-Strength Meter	BN 15001	6	SBF	Wide-Band Signal Generator	BN 40861	18
HFU	VHF-UHF Field-Strength Meter	BN 15002*	6	SBR	UHF Signal Generator	BN 41027/2/50*	18
HFF	Distant-Zone Field-Strength Meter	BN 1502	6	SBT F	TV Channel Signal Generator	BN 41601/..*	21
HS 729/1	Freq. Dev. Meter f. TV Sound Xmitters	—*	8	SC R	UHF Signal Generator	BN 41026/50*	18
HUZ	VHF Field-Strength Indicator	BN 15012/2	6	S D A F	UHF Std. Signal Gen. f. AM, FM & TV	BN 41023/2/50*	18
HUZD	UHF Field-Strength Indicator	BN 15014	6	SDR	UHF Signal Generator	BN 41022/50*	18
K				SIT	Beat-Frequency Oscillator	BN 40341	18
KARU	Capacitance Meter	BN 510	31	S K T C	Coaxial SHF Noise Generator	BN 4153/50*	20
KGM	Variable Test Capacitor	BN 532	33	S K T D	Coaxial UHF Noise Generator	BN 4152/50*	20
KKH	Direct-Capacitance Meter	BN 5201	31	S K T U	Noise Generator	BN 4151/2/50*	20
KMD	Wire Test Jig	BN 5731	13	S L R D	UHF Power Signal Generator	BN 41004/50*	18
KMF	Liquid-Specimen Container	BN 5721/2	13	S L S D	UHF Signal Generator	BN 41003/50*	18
KMFG	Large Liquid-Specimen Container	BN 5722	13	S L S V	VHF Signal Generator	BN 41002/50*	18
KMT	Guard-Ring Capacitor	BN 5711	13	SMA F	Std. Signal Gen. for AM, FM & TV	BN 41404	18
KVZA	Aut. Test Bridge f. Heavy-Curr. Cap.	BN 555	32	SMA R	Power & Std. Signal Generator	BN 4123	18
KZS	Limit Bridge	BN 5500	31	SMC	Carcinotron Signal Generator	BN 410300*	18
KZT	Microfarad Meter	BN 5400	31	SMCK	SHF Signal Generator	BN 410420*	18
L				SMLM	Power Signal Generator	BN 4105	18
LARU	Inductance Meter	BN 610	32	SMLR	Power Signal Generator	BN 41001	18
LCB	L-C Precision Bridge	BN 620	32	SRB	RC Oscillator	BN 40851	18
LDH	Decade Inductor	BN 6321*	33	SRM	RC Generator	BN 4085	18
				SRR	RC Generator	BN 4084	18
				SSF	Test Pattern Generator	BN 4237	21
				SUF	Noise Generator	BN 4150	20
				SUN	AF Transmission Measuring Set	BN 40871*	17

Type	Designation	Order No.	Page
S W F	Sweep Signal Generator	BN 4243/2	21
S W H	Sweep Signal Generator	BN 4242/2	21
S W O B	Polyskop	BN 4244/50*	17
S W O F	Videoskop	BN 4241	17
S W U	UHF Sweep Signal Generator	BN 4246/50*	21
S Z F	Auxiliary Sync Generator	BN 42269	8
T			
T A N	Bal. General-Purpose Transformer	BN 96900*	34
T S I	Selective Impedance Transformer	BN 90625/50	34
U			
U B M	Tunable Indicating Amplifier	BN 12121/2	3
U D F	Twin Voltmeter	BN 19451	16
U D H	High-Voltage Electronic Voltmeter	BN 10331	2
U E 12	All-Wave Receiver	—	25
U F F	Frequency Converter	BN 19452	16
U H P	High-Voltage Tester	BN 1950	33
U I T	AF Wattmeter & R.M.S. Voltmeter	BN 2300	10
U M F	Picture Transmitter Test Assembly	BN 1940/III/50*	8
U P K	Small Level Meter	BN 1061*	2
U R I	Electronic Multimeter	BN 1050	2
U R U	DC-UHF Electronic Multimeter	BN 1080	2
U R V	UHF Millivoltmeter	BN 10910/50*	2
U S V D	UHF Test Receiver	BN 1523/50*	5
U S V F	Selective VHF/UHF Voltmeter	BN 1528/50*	5
U S V H	Selective Microvoltmeter	BN 1521	4
U S V U	UHF Test Receiver	BN 1524	5
U S W V	Selektomat	BN 15221/50*	5
U V F	Video Millivoltmeter	BN 12015	3
U V H	RF Millivoltmeter	BN 12021	3
U V M	Microvoltmeter	BN 12011	3
U V N	AF Millivoltmeter	BN 12001	3
V			
V K B	Dielectric Test Bridge	BN 3520	13
V K S	Dissipation-Factor Meter	BN 3530*	13
V L U	Admittance Meter	BN 3510	14
V L U K	Admittance Meter	BN 3511	14
W			
W A B	SHF Wide-Band Frequency Meter	BN 4324	22
W A L	UHF Resonance Frequency Meter	BN 4321/2/50*	22
W A M	Resonance Frequency Meter	BN 4312/2	22
W A T	SHF Resonance Frequency Meter	BN 4322/50*	22
W E N	Frequency Meter	BN 435	22
W F C	SHF Frequency Meter	BN 432811/137*	22
W I D	VHF-UHF Frequency Meter	BN 442	23
W I K	Frequency Meter	BN 4421	23
X			
X K B	Recorder	BN 444811	25
X K C	Phase Comparator	BN 444812	25
X M A	Recorder	BN 444512	24
X M E	Mixer & Harmonic Generator	BN 444522	24
X N Y	Mains Monitor	BN 444932	25
X N Z	Emergency Power Converter	BN 444931	25
X S A	Frequency Standard	BN 444111	25
X S B	Frequency Standard	BN 444112	24
X U A	Frequency Synthesizer	BN 444463	24
X U B	Frequency Synthesizer	BN 444465	24
X U D	Decade Synthesizer and Exciter	BN 444473	24
X V B	Frequency Divider	BN 444412	25
X V C	Frequency Divider	BN 444413	25
X V D	Times-Ten Frequency Multiplier	BN 444421	7
X Z A	Decade Frequency Measuring System	BN 444043*	24
Z			
Z C P	SHF Directional Coupler	BN 35711/137*	15
Z D D	Z-g Diagram	BN 3562/50*	14
Z D P	Reflectometer	BN 35691/50*	15
Z D U	Z-g Diagram	BN 35610/50*	14
Z P K	Admittance Meter	BN 3565	14
Z S G	DC Recorder Enograph-G	BN 18532*	30
Z U P	Reflectometer	BN 3569/50*	15
Z U P I	Impulse Reflectometer	BN 35683/50*	15
Z W C	SHF Visual-Display Sweep Gen. Assy.	—*	16

Quick Index

Voltmeters without Preamplification	2
Voltmeters with Preamplification	3
Test Receivers	4
Field-Strength Meters	6
Amplifiers	7
Modulation Test Sets	8
Power Meters	9
Standard Resistors and Load Resistors	11
Standard Attenuators, Attenuator Pads, Delay Lines	12
Impedance Meters, Slotted and Non-Slotted Lines	13
Meas. Instruments for Transmission Parameters	16
Oscillators, Signal Generators and Modulators	18
Frequency Meters	22
Frequency Measuring Systems, Frequency Synthesizers and Frequency Standards	24
Standard Time Systems, Frequency Standards	25
Wave Analyzers	26
Acoustic Test Sets and Vibration Meters	28
Recorders and Oscilloscopes	30
Capacitance Meters and Standard Capacitors	31
Inductance Meters and Standard Inductances	32
Power Supplies	33
Transformers and Matching Pads	34
Components and Sundries	35

R&S VOLTMETERS WITHOUT PREAMPLIFICATION



Electronic Multimeter Type URI

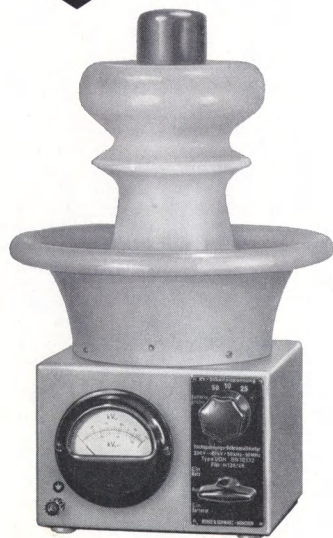
AC voltage measurement: 0.1 to 300 v, peak response, calibration in rms values on a sine wave (volts and db). Frequency range: 30 cps to 20 Mc; with URI Probe: 10 kc to 250 Mc (at 10 Mc: 400 k Ω , 5.3 pf shunt). The URI Plug-in Divider is capable of measuring peak voltages up to 4.5 kv at 0.1 to 200 Mc. *Alternating-current measurement:* 100 μ a to 1 amp at 30 cps to 2 Mc, floating. *DC voltage measurement:* 20 mv to 1 kv; input resistance 10 M Ω or 100 M Ω , floating; the URI DC Probe permits DC voltage measurement without affecting AC voltage conditions. The URI 30-KV Probe makes possible measurement up to 30 kv; input resistance 1000 M Ω . *Direct-current measurement:* 2×10^{-9} amp to 1 amp, floating. *Resistance measurement:* 10 Ω to 1000 M Ω . The maximum power into the item under test is less than 3 mw. Connection to all inputs of the set is possible at the same time. R&S Standard Cabinet 35. †

► Order Number of the instrument – BN 1050. Order Numbers of accessory units: URI Probe – BN 10501; URI Plug-in Divider – BN 10502; URI 30-KV DC Probe – BN 10503; URI DC Probe – BN 10504.

High-Voltage Electronic Voltmeter UDH $\uparrow 0.2$ to 50 KV \downarrow

This instrument is intended for RF voltage measurements on transmitter systems. It indicates peak voltages from 200 v to 50 kv in the frequency range 50 kc to 30 Mc. Additional calibration in rms values. Operation from self-contained battery or AC supply, switch-selected. Panel meter may be removed and connected to set via cable for remote measuring.

► Order Number BN 10331.



UHF-Millivoltmeter URV $\uparrow 1$ KC to 1600 MC (2400 MC) \downarrow

In conjunction with its probe, the set is preferably used where very low capacitive loading of the check point is a must in the measurement of small RF voltages. With the 10:1 plug-in divider, it is possible to measure RF voltages from 30 mv to 100 v, the shunt capacitance being only 0.8 pf. Voltage measurement up to 300 Mc. Coarse voltage indication possible up to 2000 Mc, e.g. for relative measurements such as made to determine the attenuation. Lowest measurable voltage without divider – 3 mv. Four plug-in dividers, 3:1, 10:1, 25:1, 50:1, extend the voltage range to 500 v, max. The URV Insertion Unit permits accurate voltage measurements on coaxial cables up to 1600 Mc. For coarse voltage indication the URV Insertion Unit is usable up to 2400 Mc. R&S Standard Cabinet 35. †

► Order Number for 50 Ω – BN 10910/50; for 60 Ω – BN 10910/60; for 75 Ω – BN 10910/75.

Small Level Meter Type UPK

A small and lightweight instrument for accurate level measurements in telephone and carrier-frequency engineering. Direct calibration in nepers and/or db. Dimensions: R&S Standard Cabinet 14. \blacktriangleright –2 to +3 nepers or –15 to +30 db in 4 steps, 30 cps to 20 kc, input 600 Ω / > 10 k Ω selectable: Order Number BN 1061. –2 to +3 nepers in 4 steps, 3 kc to 600 kc, input 75 Ω / 150 Ω / 174 Ω / 600 Ω / > 4 k Ω selectable: Order Number BN 1062.

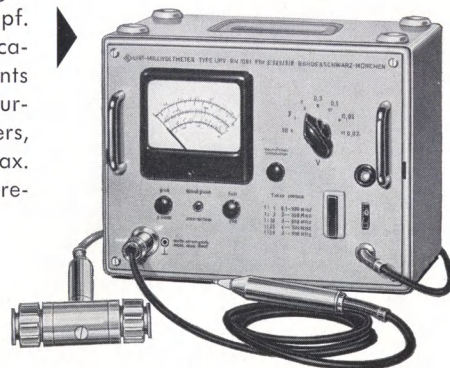
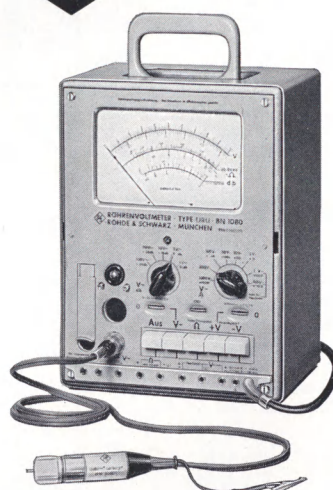


DC-UHF Electronic Multimeter Type URU

$\uparrow 10$ CPS to 1500 MC (3000 MC) \downarrow

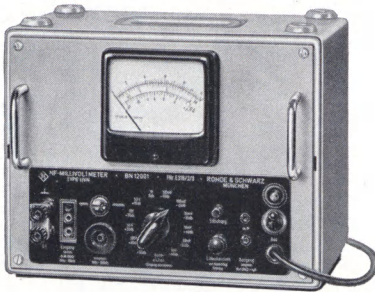
AC voltage measurement (peak response, calibration in v and db rms values on a sine wave): 10 cps to 1 Mc via sockets – 0.1 v to 1 kv. 10 kc to 800 Mc (up to 3000 Mc coarse indication) with probe, probe and multiplier, or probe and probe insertion adapter – 0.1 v to 2.5 kv. 10 kc to 1500 Mc with insertion units – 0.1 v to 1.5 kv. *DC voltage measurement:* 5 mv to 1 kv with 10 M Ω / 100 M Ω ; with DC probe – input capacitance 1 pf; with high-voltage DC probe, 1000 M Ω – up to 30 kv. *Resistance measurement:* 0.5 Ω to 3000 M Ω in 7 ranges; maximum power into test item – less than 2.5 mw. R&S Standard Cabinet 35. †

► Order Number of Type URU with probe BN 1080. Order Numbers of accessories: Multiplier 2500 v – BN 10802. Probe Insertion Adapter 100 v, Dezifix B, 50 Ω – BN 10803/50; 60 Ω – BN 10803/60; 75 Ω – BN 10803/75. Insertion Unit 30 v, 10 kc to 1500 Mc, Dezifix B, 50 Ω – BN 10804/50; 60 Ω – BN 10804/60; 75 Ω – BN 10804/75. Insertion Unit 300 v, 10 kc to 1200 Mc, Dezifix B, 50 Ω – BN 10805/50; 60 Ω – BN 10805/60; 75 Ω – BN 10805/75. Insertion Unit 450 v, 10 kc to 1200 Mc, Dezifix C, 50 Ω – BN 10805/2/50; 60 Ω – BN 10805/2/60; 75 Ω – BN 10805/2/75. Insertion Unit 1500 v, 10 kc to 1200 Mc, Dezifix D, 50 Ω – BN 10806/50; 60 Ω – BN 10806/60. DC Probe, 1 pf – BN 10504. 30-KV DC Probe – BN 10503.



AF Millivoltmeter Type UVN $\uparrow 10$ CPS to 100 KC \downarrow

This millivoltmeter permits measurements in the range 20 cps to 20 kc if the balanced input is used and in the range 10 cps to 100 kc if the unbalanced input is used. The voltage range, 0.1 mv to 300 v or -80 db to $+52$ db, is covered in 12 steps. The high impedance ($1\text{ M}\Omega$) or the unbalanced input is intended for measurements on high-impedance voltage sources, the balanced input (impedance $20\text{ k}\Omega$) for measurements on telephone communication systems. The AF millivoltmeter is also usable as an amplifier featuring a gain of 1000. R&S Standard Cabinet 35. €
► Order Number BN12001.



Video Millivoltmeter Type UVF $\uparrow 10$ CPS to 10 MC \downarrow

Preferably used for measurements in TV studios and on TV transmitters, e.g., in conjunction with the TV Demodulator Type AMF for determining the frequency response of transmission systems. Frequency range — 10 cps to 10 Mc. Voltage range — 0.1 mv to 3 v (-80 to $+12$ db) in 8 steps. Peak-to-peak indication, square waves up to a duty cycle of 1:2000. Calibration in rms values of a sine wave. Bridging-type input $75\text{ }\Omega$. Usable as video amplifier, phase lag being a linear function of frequency. Output about 2 v_{pp} . R&S Standard Cabinet 56. €
► Order Number BN12015.

Tunable Indicating Amplifier Type UBM $\uparrow 45$ CPS to 600 KC \downarrow

Indicates voltages from $3\text{ }\mu\text{v}$ to 100 v in the frequency range 45 cps to 600 kc. Suitable above all where spurious voltages (harmonics, hum) are present and only relative voltage measurements (measurement of high attenuation and similar substitution measurements or detection of unbalance voltages in bridge circuits) are required. Unwanted voltages suppressed more than 1:100 by tuning. Bandwidth in tuned operation adjustable between 1 and 10%. When switched from tuned to broadband operation the UBM can also be used as a broadband amplifier. Harmonic distortion less than 1.5%. R&S Standard Cabinet 46. €
► Order Number BN12121/2.

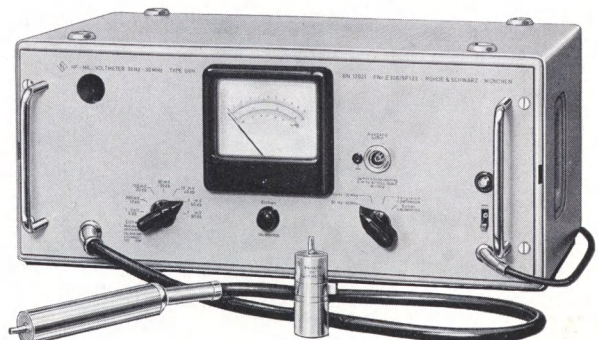


RF Millivoltmeter Type UVH $\uparrow 30$ CPS to 30 MC \downarrow

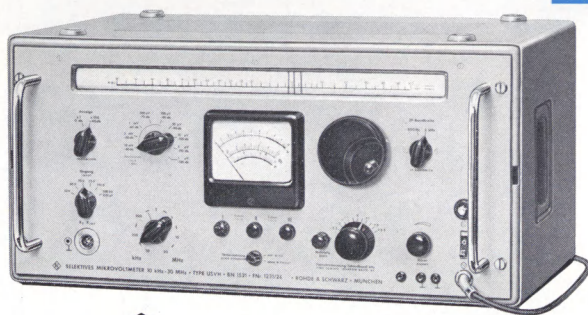
Exceptionally large bandwidth — 30 cps to 30 Mc. $100\text{ }\mu\text{v}$ to 100 v or -80 to $+42$ db in 10 steps. Especially for carrier- and video-frequency engineering. By a built-in high-pass filter, the frequency range can be reduced to a band of 10 kc to 30 Mc to eliminate spurious AF voltages. Unbalanced input designed as a probe, input impedance about $500\text{ k}\Omega$ shunted by 10 pf. Usable as broadband amplifier, phase lag nearly linear up to about 10 Mc. The set can be used also as a pre-amplifier for an oscilloscope. R&S Standard Cabinet 56. €
► Order Number BN12021.

Microvoltmeter Type UVM $\uparrow 20$ CPS to 1 MC \downarrow

The Microvoltmeter Type UVM measures voltages and levels from background noise of about $10\text{ }\mu\text{v}$ up to 10 v or $+22$ db in the frequency range 20 cps to 1 Mc (unbalanced input) or 30 cps to 600 kc (balanced input). A built-in low-pass filter permits reduction of the frequency range. The voltage range is divided into 10-db steps. In addition, the instrument can be used as broadband amplifier, the phase lag being a linear function of frequency; the output voltage at full-scale deflection of the microvoltmeter is about 1 v unbalanced. R&S Standard Cabinet 56. €
► Order Number BN12011.



R&S TEST RECEIVERS



Selective Microvoltmeter $\uparrow 10$ KC to 30 MC \downarrow Type USVH

Exceptionally high sensitivity and selectivity make the Selective Microvoltmeter Type USVH useful for a great number of measurements in high frequency engineering for which up to now a voltmeter was either unsuitable or could be employed only in conjunction with auxiliary units. Its measurement range from 0.2 μ v to 1 v or -134 to +2 db, high selectivity, switch-selected bandwidth of 500 cps or 5 kc, precision vernier tuning, switch-selected input impedance of 50 Ω , 60 Ω , 70 Ω , 75 Ω , 150 Ω and 500 k Ω shunted by 20 pf, as well as voltage and level ranges in 13 sub-ranges make the Selective Microvoltmeter Type USVH an extremely versatile instrument. R&S Standard Cabinet 57. ☞

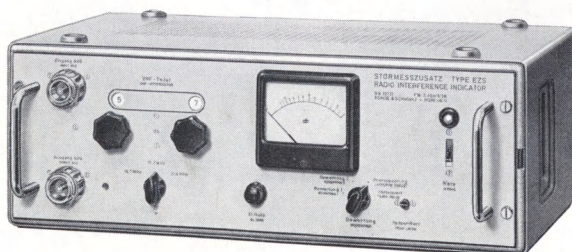
► Order Number BN 1521.



VHF Monitoring Receiver $\uparrow 30$ to 180 MC \downarrow Type ESM 180 VHF Monitoring Receiver $\uparrow 85$ to 300 MC \downarrow Type ESM 300

Superheterodyne receivers suitable for radio monitoring and radio interference control. These receivers enable the reception of both frequency- and amplitude-modulated signals. An output provided for connection of an oscilloscope permits pulse-modulated carriers and noise spectra up to 100 kc bandwidth to be investigated. Since the input voltage is indicated on a meter, this receiver, in conjunction with a standardizing oscillator, can also be used for measuring field strength. A beat-frequency oscillator, switch-selected IF and AF bandwidths, IF conversion in narrow-band operation and amplitude limiting in the IF section contribute to the versatility of this set. R&S Standard Cabinet 56. ☞

► Order Number Type ESM 180 – BN 15073/2; ESM 300 – BN 15074/2.



VHF Receiver $\uparrow 30$ to 330 MC \downarrow Type ESG

The VHF Receiver Type ESG is used as a communication and monitoring receiver covering the entire VHF range from 30 to 330 Mc. It provides for reception of the various radio services operating in this range, such as FM broadcasting, fixed and mobile radio stations using narrow-band frequency modulation, FM directional radio for carrier-frequency telephony, and aircraft radio employing amplitude modulation. Special features provided for these purposes are an adjustable squelch circuit, a noise limiter, and a beat-frequency oscillator for telegraphy on keyed continuous waves. With certain qualifications imposed by the maximum IF bandwidth of 300 kc, the receiver lends itself also to monitoring television and pulse-modulated transmitters. The VHF receiver has all facilities and properties required for the direct measurement of frequencies, of field strengths – in conjunction with an aerial and a standard oscillator –, of fre-



quency deviations, and of the percentage modulation. Moreover, this receiver can be used as a microvoltmeter for laboratory measurements. Electronic regulation of all operating voltages ensures that the frequency accuracy and gain remain constant even with supply voltages varying as much as $\pm 10\%$. Thus accurate measurements and recordings over long periods of time are possible. Special calibration circuits have been incorporated to permit continuous monitoring of the essential characteristics of the receiver and their readjustment to the nominal value. The electrical design, great versatility and extraordinary ease of operation make this receiver a high-quality set. The change-over between the individual frequency ranges is achieved by built-in servo-motors. The complete equipment consists of the receiver proper shown in the picture above and of a separate power supply requiring no attendance. Dimensions: 540 x 405 x 520 mm. ☞

► Order Number BN 15075.

Radio Interference Indicator Type EZS

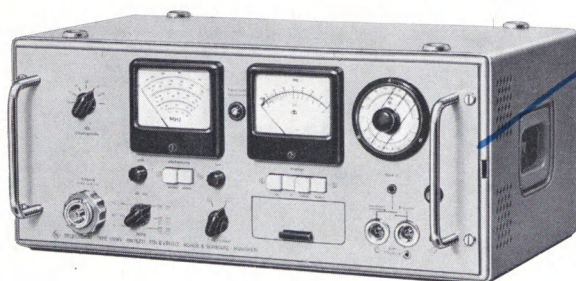
The Radio Interference Indicator Type EZS permits a VHF radio interference test assembly complying with the German VDE 0876 recommendation to be set up in conjunction with a receiver which has no special facilities for radio interference measurements. Suitable for intermediate frequencies of 2 Mc, 10.7 Mc, 15.7 Mc or 21.4 Mc, the EZS is connected to the IF output of the receiver. Input impedance is 60 Ω ; input requirement 1 to 8 mv, adjustable. Indication: Two weightings; overdrive check; average and peak. In addition, a built-in RF attenuator is provided: characteristic impedance 60 Ω , frequency range 0 to 330 Mc, attenuation 6 times 10 db and 10 times 1 db. R&S Standard Cabinet 55. ☞

► Order Number BN 15131.



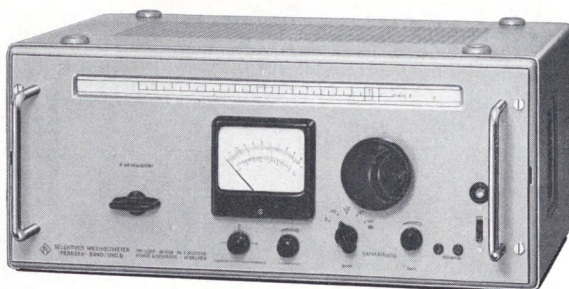
Selektomat $\uparrow 30$ to 400 MC \downarrow Type USWV

The Selektomat Type USWV, a new selective vacuum tube voltmeter in the VHF band, automatically tunes to the frequency. It scans the entire VHF band, locks on the signal of highest amplitude and gives direct reading of its two characteristic values, i.e., of the frequency in Mc and of the amplitude in db. This means that it offers broadband and selective features at the same time. During frequency changes, the Selektomat follows, almost without inertia, the signal automatically picked up or a weaker signal



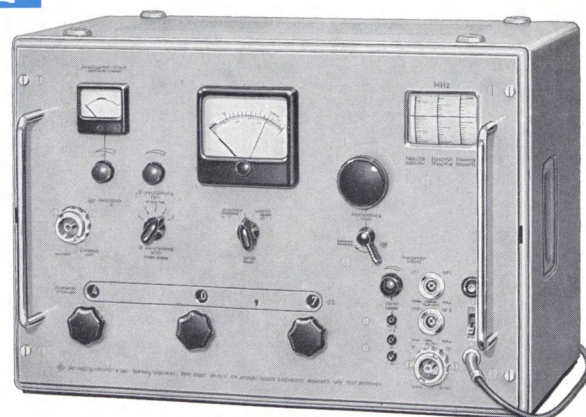
New

tuned in by hand. Thus it eliminates the tedious tuning to unstable frequencies or in point-by-point measurements. It even follows swept frequencies, e.g., that of the Polyskop I. For many measuring instruments, the Selektomat Type USWV is thus an ideal pre-amplifier which considerably increases the measurement sensitivity. Smallest indicated input voltage and threshold for frequency tracking: about 10 μ v. Indication: linear or logarithmic. Over-driving limit: 1 v. The automatic tuning is switch-selected. The novel vacuum tube voltmeter Selektomat USWV simplifies electronic measurements. Dimensions: R&S Standard Cabinet 56. $\text{R}\&\text{S}$
 ► Order Number for 50 Ω – BN 15221/50; 60 Ω – BN 15221/60.



Selective VHF/UHF Voltmeter \uparrow Bands I, III, IV, V \downarrow Type USVF

The Selective VHF/UHF Voltmeter USVF is a tunable relative-voltage meter for maximum voltage ratios of 60 to 70 db and is specially designed for television engineering. It is basically a superheterodyne receiver with a band-pass filter at the input and high selectivity in the IF section. The reading is taken from a meter with a peak-responding rectifier and rms-value calibration. For the television Bands I and III (channels 1 to 11): voltage range 0.2 mv to 1.5 v; for TV Bands IV and V (channels 14 to 53): 0.3 mv to 1.5 v. The IF bandwidth is 8 kc. Some examples of application: measurement of the amplitude ratio of picture and sound carriers, point-by-point measurement of the spectral energy distribution within the sidebands of the picture carrier, measurement of modulation depth and distortion. R&S Standard Cabinet 56. $\text{R}\&\text{S}$
 ► Order Numbers: Bands I and III, 50 Ω – BN 1528/50; 60 Ω – BN 1528/60; Bands IV and V, 50 Ω – 15285/50; 60 Ω – 15285/60.

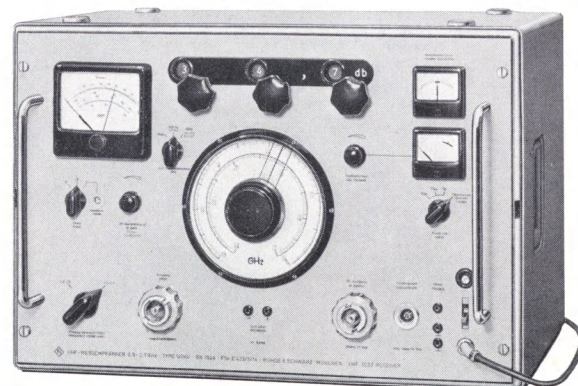


UHF Test Receiver $\uparrow 280$ to 940 MC \downarrow Type USVD

The UHF Test Receiver Type USVD is preferably employed for measuring voltage ratios; i.e., it is a relative-voltage meter permitting accurate measurements to be made on filters and attenuators as well as of VSWR's and reflection coefficients. The instrument is a superheterodyne receiver incorporating a built-in attenuator box. Extension of the measurement range up to 4600 Mc is possible, the input voltage being mixed with harmonics of the local oscillator. The rectified IF voltage can easily be read on a meter featuring relative calibration for a normal and for an expanded range. The noise figure in the fundamental frequency range is 15 to 16 db in the case of a voltage source of 50 to 75 Ω internal impedance. R&S Standard Cabinet 510. $\text{R}\&\text{S}$
 ► Order Number for 50 Ω – BN 1523/50; 60 Ω – BN 1523/60.

UHF Test Receiver $\uparrow 900$ to 2700 MC \downarrow Type USVU

A superheterodyne receiver with broadband input; covers 900 to 2700 Mc in 2 bands. High sensitivity. Absolute power measurement. Accurate relative voltage measurement. Output for recorder. Power ratios up to 80 db are measured with the built-in IF meter and attenuator box (smallest step 0.1 db). Noise figure is -90 dbm at a signal-to-noise ratio of about 7 db when operating from a voltage source of 50 to 75 Ω impedance. Measurement range (full-scale deflections): -80 to -10 dbm. Accuracy, relative: $\pm 1\%$ of attenuator setting ± 0.1 db; absolute: ± 2 db. For field-strength measurements see Type HFA. Intermediate frequencies 250 Mc and 25 Mc. The lower intermediate frequency is available at a separate output and thus permits all measurements of modulation characteristics at 25 Mc. Input and output are fitted with R&S connectors Dezifix B. R&S Standard Cabinet 5101. $\text{R}\&\text{S}$
 ► Order Number BN 1524.



R&S FIELD-STRENGTH METERS

VHF Field-Strength Indicator $\uparrow 47$ to 225 MC \downarrow Type HUZ

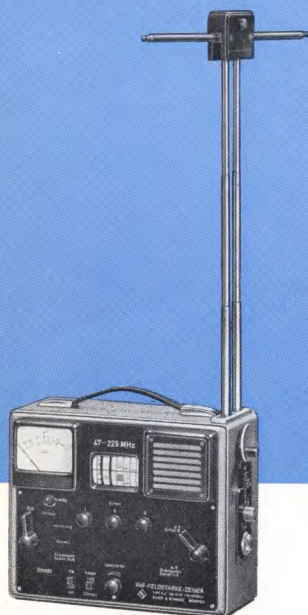
A handy test set for indicating the field strength. Measurement ranges: 5 μv to 1 mv, 1 mv to 100 mv. Accuracy: ± 6 db. Extensible dipole. VHF inputs: 60 Ω unbal. and 240 Ω balanced. Demodulation for AM and FM. Loudspeaker. Connectors for headphones. Built-in, gas-tight storage batteries. The Dimensions are 250 x 210 x 120 mm.
► Order Number Type HUZ – BN 15012/2. Charger – BN 150126; Search Coil – BN 150127; Leather Carrying Case – BN 150128.

UHF Field-Strength Indicator $\uparrow 430$ to 590 MC \downarrow Type HUZZ

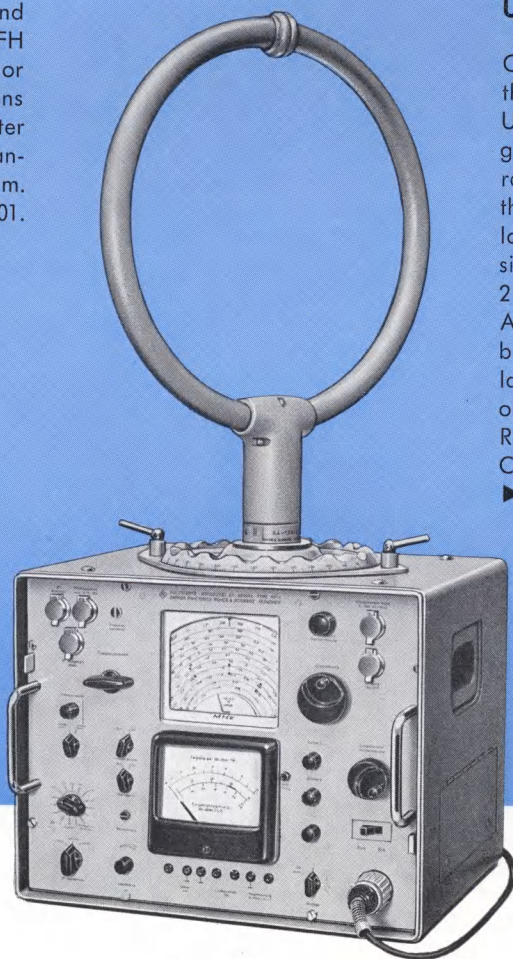
The Type HUZZ is the companion model of the Type HUZ for the frequency range 430 to 590 Mc. 4 measurement ranges: 50 to 500 μv ; 0.5 to 5 mv; 5 to 50 mv; 50 to 500 mv. Accuracy: ± 6 db. Input: 50 Ω unbalanced. Demodulation for AM and FM. Loudspeaker. Connectors for headphones. Operates from battery. Dimensions: 270 x 190 x 120 mm.
► Order Number Type HUZZ – BN 15014. Receiver only – BN 150141; Charger – BN 150146.

Field-Strength Meter $\uparrow 0.1$ to 30 MC \downarrow Type HFH

The Type HFH permits direct readings in terms of field-strength values without the use of a calibration chart. Measurement may be made with a loop antenna or with a separate rod antenna. Frequency range in 10 sub-ranges. Input impedance: 60 Ω . As field-strength meter: measurement range 0 to 120 db related to 1 $\mu\text{v}/\text{m}$, in 10-db steps. Indication range: lin. 20 db, log. 40/60 db. Accuracy: ± 1.5 db. As selective microvoltmeter: measurement range –20 to 100 db related to 1 μv . Accuracy: ± 1 db. IF bandwidth ± 100 cps, ± 500 cps or ± 4 kc selectable. Average- and peak-value indication. BFO. 500-kc crystal oscillator for self-checking. Input for high-stability oscillator. IF output. Outputs for headphones and loudspeaker. 3 loop antennae and 1 rod antenna. The Type HFH operates from AC supply or a 12-v battery. Dimensions of the Field-Strength Meter Type HFH without loop antenna: 430 x 345 x 365 mm.
► Order Number BN 15001.



Type HUZ



Type HFH



Type HFU

Distant-Zone Field-Strength Meter $\uparrow 20$ to 100 MC \downarrow HHF

Frequency range: 20 to 100 Mc in 4 sub-ranges; linear 2 to 50, 500, 5000 $\mu\text{v}/\text{m}$; logarithmic 2 to 10^3 , 10^4 , 10^5 $\mu\text{v}/\text{m}$. Accuracy: $\pm 30\%$. The linear ranges plus the built-in standardizing oscillator permit accurate comparison measurements; the logarithmic ranges enable recording of considerably varying field strengths over long periods of time. 3 loop antennae, 1 carrying case, battery case with 6-v battery, and tripod are supplied with the instrument. Operating voltage: 220 v AC supply or 6-v battery, switch-selected. Dimensions of the Type HHF without loop antenna: 425 x 325 x 295 mm.
► Order Number Type HHF plus accessories – BN 1502.

VHF-UHF Field-Strength Meter $\uparrow 25$ to 900 MC \downarrow Type HFU

The VHF-UHF Field-Strength Meter Type HFU consists of the VHF-UHF Test Receiver Type ESU and 3 broadband antennae. The frequency range of from 25 to 225 Mc, from 175 to 475 Mc or from 460 to 900 Mc can be selected using 3 RF plug-in units. Locking standardizing oscillator. Indication ranges: lin. 20 db, log. 40 db. Total measurement range: 0 to +120 db referred to 1 μv at the input. Accuracy: lin. ± 3 db. The instrument can be switched over from average-value to peak-value indication. IF bandwidth: ± 12.5 kc and ± 60 kc. BFO and automatic frequency tuning provided. AM and FM demodulation. IF output. Operation from AC supply or from 12-v battery, selectable. Dimensions: 285 x 340 x 346 mm.
► Order Numbers: VHF-UHF Test Receiver Type ESU (basic model without RF Plug-in Unit) BN 150021. RF Plug-in Unit for 25 to 225 Mc – BN 150022; for 175 to 475 Mc – BN 150023; for 460 to 900 Mc – BN 150024.

UHF Field-Strength Measuring Equipment

$\uparrow 900$ to 2700 MC \downarrow Type HFA

Comprised of the UHF Test Receiver Type USVU (see page 5), the UHF Parabolic Antenna Type HA 262 and the Switchable UHF Bandpass Filter Type PBA. Primarily used for investigating wave propagation, e.g., in the planning of radio relay links. The range of application also includes measuring the gain and directional characteristics of antenna installations and the measurement of reradiations from receivers, signal generators, etc. Frequency range: 900 to 2700 Mc in 2 sub-ranges. Sensitivity: 50 $\mu\text{v}/\text{m}$ with about 7 db S/N ratio. Automatic frequency tuning by motor. Image rejection: better than 30 db with Switchable Bandpass Filter. Demodulation for AM. IF bandwidth: 2 Mc. IF output, outputs for oscilloscope and recorder. Dimensions: Test Receiver – R&S Standard Cabinet 5101; Bandpass Filter – R&S Standard Cabinet 55; Parabolic Antenna – 900 mm in dia.
► Order Number Type HFA – BN 15003.

R&S AMPLIFIERS

VLF Wide-Band Amplifier Type ANT $\uparrow 2$ CPS to 20 KC \downarrow

The instrument has an output power of 2 w even at low frequencies. Frequency range: 2 cps to 20 kc. Input voltage: 8 v at 1 M Ω . Balanced output; 150 and 600 Ω switch-selected. Distortion: less than 2%. The Type ANT serves, e.g., as a power amplifier for the RC Generator Type SRN. R&S Standard Cabinet 46. ⚡

► Order Number BN 13140.

Power Amplifier Type ATN $\uparrow 30$ CPS to 20 KC \downarrow

The Type ATN gives a max. continuous power of 50 w. Frequency range: 30 cps to 20 (40) kc. Voltage requirement: abt. 0 db across 100 k Ω , unbal. 110-v output - 20 Ω ; 220-v output - 80 Ω . It is used, e.g., with standard frequency generators for feeding synchronous motors and synchro-controlled systems. R&S Std. Cabinet 57. ⚡

► Order Number BN 13193.

Peak Limiter Type ABR $\uparrow 40$ CPS to 15 KC \downarrow

The Type ABR can be employed in all audio-frequency communication systems which are susceptible to overdriving, for example, in radio and sound recording equipment. Frequency range: 40 cps to 15 kc; input level: +6 db or +12 db, switch-selected. The compression is such that the output level remains resp. under +7.5 db or +13.5 db when overdriven by 10 db, maximum. Gain is 0 db. Input and output are balanced. R&S Standard Cabinet 53. ⚡

► Order Number BN 1601.

TV Modulation Amplifier Type ABF $\uparrow 5$ CPS to 10 MC \downarrow

The instrument is used, e.g., as a modulation amplifier for the Standard Signal Generator Type SMAF. The purpose of the Type ABF is to amplify the picture and synchronizing signals from 0.5 v_{pp} to 8 v_{pp} without amplitude or phase distortion. Input and output of the Type ABF are designed for positive video signals. Frequency range: 5 cps to 10 Mc. R&S Standard Cabinet 53. ⚡

► Order Number BN 13711.

Tunable VHF Amplifier Type ASV $\uparrow 30$ to 300 MC \downarrow

The multi-purpose instrument for the VHF range combines a tunable amplifier, a receiver and a signal generator. The VHF output voltage is adjustable from 3 mv to 3 v across 50 or 60 Ω . Input requirement for full drive of the amplifier is 50 mv, approx. External modulation of the VHF voltage, or internal modulation with 1000 cps possible. Built-in demodulator for the reception of amplitude modulated VHF signals. Using the Mixer & Harmonic Generator, available as an extra, measurement frequencies can be multiplied and converted. R&S Standard Cabinet 35. ⚡

► Order Number BN 1372, Mixer & Harmonic Generator BN 13721.

Times-Ten Frequency Multiplier Type XVD $\uparrow 3$ to 30 MC $\times 10$ \downarrow

The Times-Ten Frequency Multiplier Type XVD supplies a frequency between 30 and 300 Mc when 0.1 to 5 v with a frequency of one-tenth the desired output frequency is applied to its input. The only multiplication factor is ten. Unwanted frequencies are attenuated by more than 60 db. The output voltage is indicated and adjustable between 0.3 mv and 3 v. An oscillator can be switched into circuit to make the multiplier a 30 to 300-Mc signal generator. External and internal (1 kc) AM from 0 to 90 % and % mod. indication are provided. A few applications are: extending the range of signal generators and frequency meters up to 300 Mc, times-ten multiplication and amplification for crystal oscillators, generation of wide frequency swings, measurement of unwanted frequency swing at 3 to 30 Mc with Frequency Deviation Meter Type FMV, etc. R&S Standard Cabinet 571. ⚡

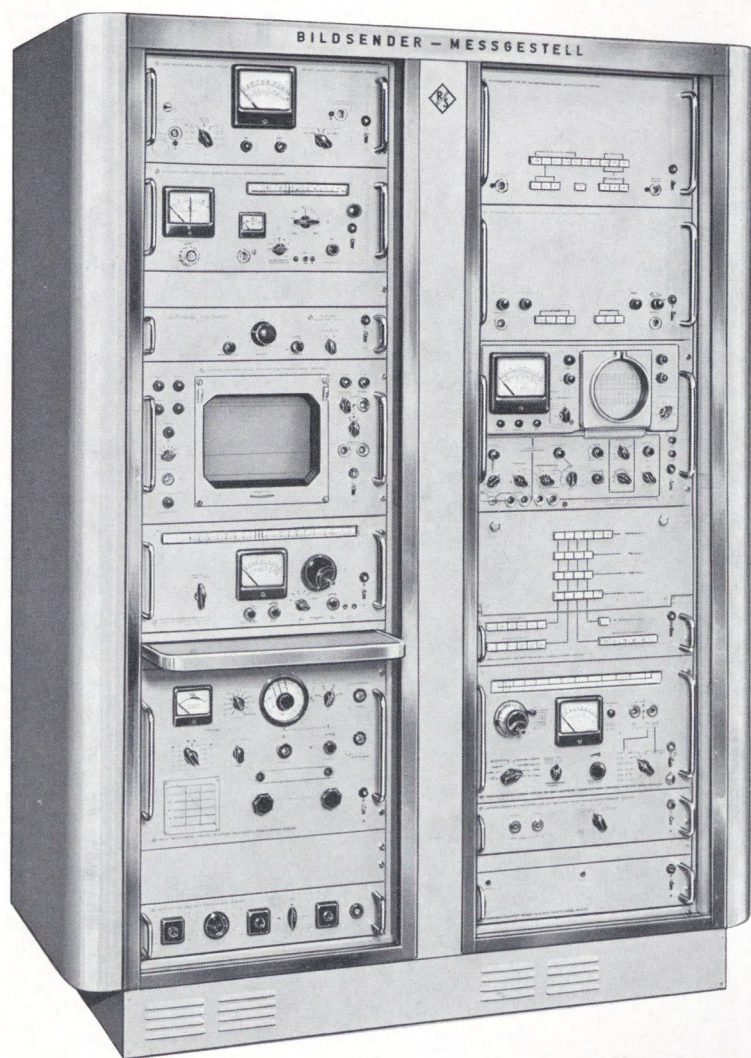
► Order Number BN 44421.



New

Type HFA

R&S MODULATION TEST SETS



Picture Transmitter Test Assembly comprised of: Video Millivoltmeter Type UVF, TV Demodulator Test Set, Sideband Adapter with Videoskop Type SWOF, Selective VHF Voltmeter Type USVF, Impulse Reflectometer Type ZUPI, Mains Switching Panel, Test Pattern Generator Type SSF, Signal Mixer Type MSF, Precision Oscilloscope Type OMF, Signal Distribution Panel, Wide-Band Signal Generator Type SBF, Auxiliary Sync Generator Type SZF, Buffer Amplifier.

Frequency Deviation Meter for TV Sound Transmitters Type HS 729 †Bands IV/V†

The Type HS 729 is essentially used for performance measurements on UHF-FM transmitters. Operating frequency selectable from 470 Mc to 790 Mc using suitable oscillator crystals. Frequency deviation in 3 ranges — i.e., 0 to 0.35 kc, 0 to 14 kc, 0 to 70 kc —, carrier centre-frequency error within ± 100 kc, and amplitude modulation depth from 0 to 0.7% and 0 to 7%. Adjustable peak deviation signalling. De-emphasis can be cut in. Balanced test output. Dimensions of the plug-in unit: 520 x 168 x 300 mm. ‡

► Designation for ordering: Frequency Deviation Meter complying with ARD Standards, Type HS 729/1, complying with DBP Standards, Type HS 729/2.

Sound Transmitter Test Assembly Type NM 674/4

The Sound Transmitter Test Assembly monitors frequency-modulated broadcasting transmitters. It is used to check that the distortion, frequency response and S/N ratio of the transmitters comply with the standards. The Test Assembly is comprised of the Deviation Meter HS 89/13, a push-button panel for selecting the modulation channel, the AF Transmission Measuring Set Type SUN with Switching & Filter Panel, the Direct-Reading Distortion Meter Type FTZ, a loudspeaker with amplifier and the Mains Switching Panel HS 394. Dimensions: 689 x 2012 x 600 mm. ‡

► Designation for ordering: Type NM 674/4.

Picture Transmitter Test Assembly Type UMF †Bands I and III or IV and V†

The Picture Transmitter Test Assembly monitors television transmitters and TV transmitting antennae in the Bands I, III, IV and V as well as links and programme lines in compliance with the CCIR recommendations, the standards of the ARD (association of the broadcasting corporations in Western Germany) and the Post Office in Western Germany. The test assembly can be used for all measurements occurring in the video and VHF/UHF ranges of a transmitting system ● Measurement in the video range: transient response at low and high frequencies; linearity of the transmission system, especially of the modulation characteristic of the picture transmitter; level measurements including test-line method; signal-to-noise ratio measurement according to the quasi-peak-value method and according to CCIR; behaviour of impulse regeneration circuits; swept-frequency and point-by-point amplitude/frequency response measurement ● Measurement in the VHF/UHF range: side-band characteristic of a picture transmitter with or without vestigial side-band filter by swept-frequency or, with higher accuracy, point-by-point method with a selective voltmeter, always at the power output of the transmitter; reflection of a television transmitting antenna in the Bands I and III by the RF impulse method ● The Picture Transmitter Test Assembly Type UMF is outstanding for its well-arranged layout and push-button selection of all test methods without requiring any cable connections. Thus a great number of measurements can be made within a short time and with ease of operation. In an R&S two-bay cabinet rack, 14 self-contained units are incorporated, most of them being conventional standard items. The nominal value of the characteristic impedance for the video connectors is 75 Ω for all models. Dimensions of the Picture Transmitter Test Assembly: 1420 x 1940 x 760 mm. ‡

► Order Numbers:

for the Bands I and III, 50- Ω model — BN 1940/III/50

for the Bands I and III, 60- Ω model — BN 1940/III/60

for the Bands IV and V, 50- Ω model — BN 1940/V/50

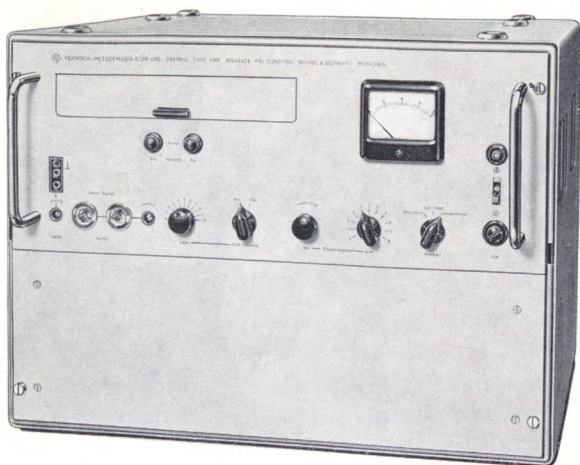
for the Bands IV and V, 60- Ω model — BN 1940/V/60.

Frequency Deviation Meter Type FMV †20 to 300 (600) MC†

The Type FMV is a high-grade FM test demodulator which is used for measurements in the development and production as well as for continuous monitoring of FM transmitters. An important application is, for example, measurement of the relative centre-frequency deviation for point-by-point determination of modulation characteristics. The Type FMV gives direct reading of the frequency deviation in the ranges 0 to 10/30/60/150 kc, of the AM modulation depth 0 to 10/30% for transmitters modulated by 30 to 15,000 cps, and of relative centre-frequency departures up to ± 100 kc. De-emphasis of 50 μ s can be switch-selected for indication, test output, or indication + test output. Direct measurement with transmitter frequencies from 20 to 300 Mc; up to 600 Mc and higher in operation with harmonics. The amplified audio frequency is available for further measurements, e.g., for determining non-linear distortions of the modulation in conjunction with the FTZ or for measuring extraneous voltages with the UVN. R&S Standard Cabinet 56. ‡

► Order Number BN 4620.

R&S POWER METERS

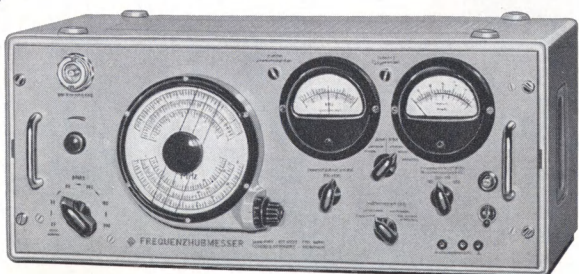


TV Demodulator Type AMF ♦Bands I, III, IV/V♦

The AMF is a high-grade demodulator for the sound and vision signal of TV transmitters. In conjunction with suitable measuring instruments the demodulator is used for the display and measurement of the transient response of the picture signal, for the measurement of the video frequency response and of the phase and group delay times, for checking the video phase pre-equalization, for measuring the grey-scale distortion, for monitoring the transmitter modulation in order to maintain the 10% residual carrier, and for monitoring the picture quality during transmission. The sound signal can be used to measure the audio-frequency response, the modulation distortion and the intercarrier S/N ratio, and to monitor the sound quality during transmission, etc. Dimensions: 540x405x496 mm. ▶ Order Numbers: Model for 41 to 68 Mc – BN 46421; for 174 to 223 Mc – BN 46423; for 470 to 790 Mc – BN 46425.

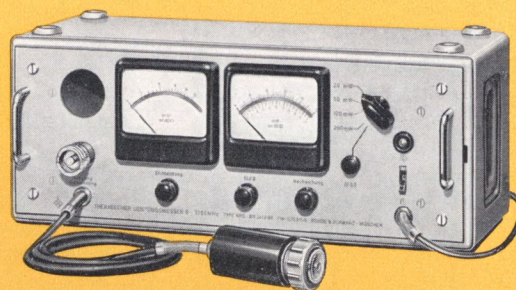
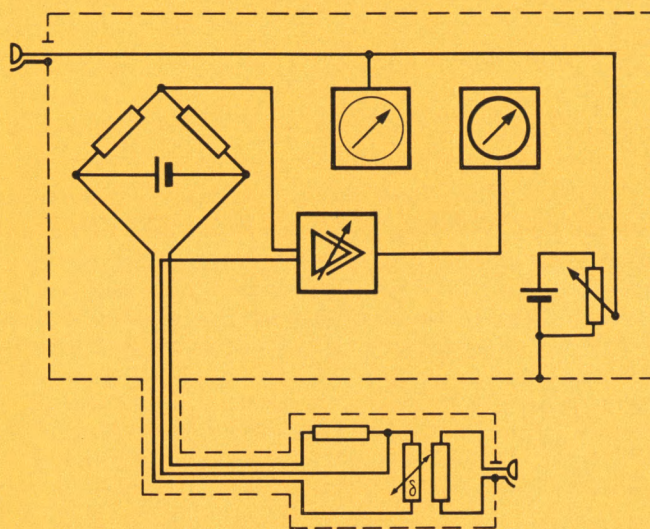
Directional Couplers Type NAF ♦TV Bands I & III♦

The Directional Couplers of the Type NAF are inserted into the aerial feeders of TV transmitters and, on each coaxial output, supply a voltage which is proportional to the incident or reflected wave and is used for measuring purposes. In particular, the output for the voltage corresponding to the incident wave generally serves for feeding the TV Demodulator Type AMF. The constructional and electrical design of the directional couplers meets the standards of good engineering. Characteristic impedance of the primary coaxial line: 60 Ω; power handling capacity: 1 kw or 10 kw; coupling attenuation: 40 or 50 db. Directivity: 46 db. Connectors: Dezifix B or D. Dimensions of the biggest model (Band I, 10 kw): 490x152x285 mm. ▶ Order Numbers: Band I (41 to 68 Mc), 1 kw – BN 464113; do 10 kw – BN 464115. Band III (170 to 230 Mc), 1 kw – BN 464133; do 10 kw – BN 464135.



Microwave Power Meter Type NRD

♦DC to 3200 MC or DC to 4500 MC♦



In contrast with RF power meters operating as peak-responding voltmeters with rectifiers, the Microwave Power Meter Type NRD measures the electrical power not as a derived quantity but directly in terms of the heat developed in its active input resistance. This active input resistance constitutes the termination of the point of measurement. The power reading is practically independent of frequency between DC and 3200 Mc or 4500 Mc. An important application of the Microwave Power Meter Type NRD is as a voltage standard, e.g., for absolute calibration of diode voltmeters in the UHF range and the lower part of the SHF range. A built-in DC voltage source and a reference panel meter permit the checking of the calibration and improving of the accuracy of individual measurements beyond the values specified below. Supply-voltage fluctuations and the ambient temperature have no influence on the reading of the Microwave Power Meter NRD.

♦Power range 0.1 to 10 mw♦ in 4 sub-ranges. Accuracy: ± 5% of f.s.d. Frequency range: DC to 4500 Mc. VSWR: 1.04 up to 2000 Mc; 1.1 up to 4500 Mc. Input impedance: 50 Ω or 60 Ω. Short-stroke connector Dezifix B. R&S Standard Cabinet 45. ▶ Order Number 50 Ω – BN 2413/50; 60 Ω – BN 2413/60.

♦Power range 1 to 200 mw♦ in 4 sub-ranges. Accuracy: ± 2.5% of f.s.d. DC to 3200 Mc. VSWR: 1.02 up to 1000 Mc; 1.03 up to 2000 Mc; 1.05 up to 3200 Mc. Input impedance: 50 Ω or 60 Ω. Short-stroke connector Dezifix B. R&S Standard Cabinet 45. ▶ Order Number 50 Ω – BN 2412/50; 60 Ω – BN 2412/60.

The above model provides for measurements up to ♦10 kw♦ in conjunction with suitable attenuators. See next page.

R&S POWER METERS / continued

Examples of Power Range Extension for the Microwave Power Meter Type NRD

Microwave Power Meter		Attenuator		Load Resistor		Total	Extended
Type	Order No.	Type	Order No.	Type	Order No.	Attenuation	Range
NRD	BN 2412/60	—	—	RBD	BN 33661/60	10 db	10 mw to 2 w
NRD	BN 2412/60	—	—	RBD	BN 33664/60	30 db	1 w to 100 w
NRD	BN 2412/60	—	—	RD 1/60	—	40 db	10 w to 1 kw
NRD	BN 2412/60	DPF	BN 18061/60	RD 10/60	—	50 db	100 w to 10 kw

For details on the load resistors with output socket and attenuators please refer to pages 11 and 12.

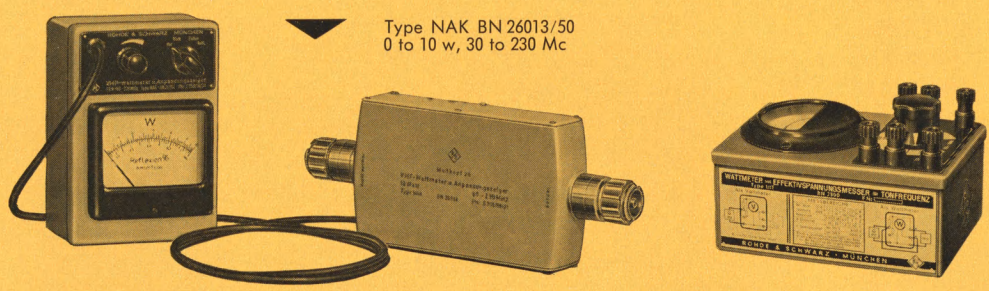
Wattmeters & Matching Indicators Types NAN, NAK, NAU and NAD

♦ Total power range 0 to 12,000 w ♦ Total frequency range 1.5 to 2800 Mc ♦

Measuring and monitoring equipment for all power and matching measurements. The measuring head is inserted into the transmission line, contains 2 directional couplers and is connected to the indicator unit via a cable. Switch-selected indication of the incident or reflected power directly in watts. In the case of instruments with direct reflection coefficient readings from 0 to 100%, the minimum incident power is tabulated below. Dimensions: Measuring Head for NAN 76 x 76 x 100 mm; for NAK 1/07 to 10/07 – 500 x 200 x 110 mm; NAK, NAU, NAD, 110 x 45 x 270 mm. Indicator Unit: NAN 130 x 180 x 150 mm; NAK 1/07 to 10/07 – chassis of R&S Standard Cabinet 55; NAK, NAU, NAD – R&S Standard Cabinet 14.

Type	Frequency Range Mc	Range of High Incident and Reflected Power w	Range of Low Reflected Power w	Minimum Incident Power Requirement w	Accuracy of Indication %	VSWR	Connectors Dezifix	Order Number
HF Wattmeter & Matching Indicator								
NAN	1.5–30	0–1000	—	15	± 5 %	< 1.04	¹	BN 260053/. ²
VHF Wattmeter & Matching Indicator								
NAK 1/07	87.5–108	0–1200	0–120	500	± 5 % ²	< 1.04	D (B)	(NAK 1/07) ⁴
NAK 3/07	87.5–108	0–4000	0–400	1500	± 5 % ²	< 1.04	D	(NAK 3/07) ⁴
NAK 5/07	87.5–108	0–6000	0–600	2500	± 5 % ²	< 1.04	D	(NAK 5/07) ⁴
NAK 10/07	87.5–108	0–12,000	0–1200	6000	± 5 % ²	< 1.04	D	(NAK 10/07) ⁴
NAK	30–230	0–10	—	7	± 5 %	< 1.02	B	BN 26013/. ⁵
NAK	30–230	0–30	—	20	± 5 %	< 1.02	B	BN 26023/. ⁵
NAK	30–230	0–100	0–10	70	± 5 %	< 1.02	B	BN 26033/. ⁵
NAK	30–230	0–300	0–30	200	± 5 %	< 1.01	B	BN 26043/. ⁵
NAK	30–230	0–1000	0–100	700	± 5 %	< 1.01	B	BN 26053/. ⁵
UHF Wattmeter & Matching Indicator								
NAU	100–600	0–10	—	7	± 5 %	< 1.02	B	BN 26113/. ⁵
NAU	100–600	0–30	—	20	± 5 %	< 1.02	B	BN 26123/. ⁵
NAU	100–600	0–100	0–10	70	± 5 %	< 1.02	B	BN 26133/. ⁵
NAU	100–600	0–300	0–30	200	± 5 %	< 1.01	B	BN 26143/. ⁵
NAU	100–600	0–1000	0–100	700	± 5 %	< 1.01	C	BN 26153/. ⁵
NAD	470–2800	0–10	—	—	± 10 %	< 1.03	B	BN 26213/. ³
NAD	470–2800	0–30	—	—	± 10 %	< 1.03	B	BN 26223/. ³
NAD	470–2800	0–100	0–10	—	± 10 %	< 1.03	B	BN 26233/. ³
NAD	470–2800	0–300	0–30	—	± 10 %	< 1.03	C	BN 26243/. ³
NAD	470–2800	0–1000	0–100	—	± 10 %	< 1.03	C	BN 26253/. ³

¹ 13-mm sockets (DIN 47284). ² Power indication ± 10 %. ³ For 50 Ω: BN/50. 60 Ω: BN/60.
⁴ Characteristic impedance 60 Ω. For 50 Ω: NAK .../.../50. ⁵ For 50 Ω: BN/50. 60 Ω: BN/60. 75 Ω: BN/75.



Type NAK BN 26013/50
0 to 10 w, 30 to 230 Mc

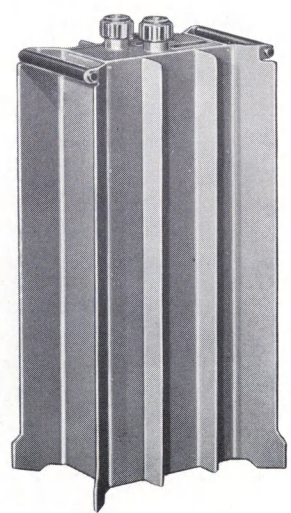
Wattmeter and R.M.S. Voltmeter for Audio Frequency Type UIT

A versatile dynamometer for the frequency range 30 cps to 10 kc. Power range 0.1 to 500 w in 8 sub-ranges; rms voltage range 25 to 250 v in 2 sub-ranges. Continuous overload capacity of current and voltage circuits is 100 %. Dimensions: R&S Standard Cabinet 14.
► Order Number BN 2300.



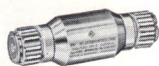
New

Type RC 10/50, 50 Ω, 10 kw, 470 to 2300 Mc



Type RBD BN 33664/60, 60 Ω, 100 w, d-c to 600 Mc

R&S STANDARD RESISTORS AND LOAD RESISTORS



Type RBD BN 33661/50
50 Ω , 2 w, d-c to 2400 Mc



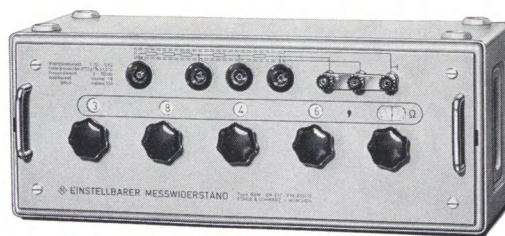
Type RBC BN 334011/50
1 w, 8200 to 12,400 Mc

Calibrated Decade Resistor Type RGM

0.1 Ω to 12 k Ω $\pm 0.1\%$ $\pm 0.01 \Omega$; DC to 300 kc;
max. 1 w, 0.5 amp. R&S Standard Cabinet 45.
► Order Number BN 332.

Calibrated Decade Resistor Type RGN

1 Ω to 120 k Ω $\pm 0.1\%$ $\pm 0.05 \Omega$; DC to 20 kc;
max. 1 w, 0.1 amp. R&S Standard Cabinet 45.
► Order Number BN 331.



Due to their special winding, these resistors feature low residual inductance and capacitance (time constant up to 1 k Ω : less than 2.3×10^{-8}). Artificial and natural aging ensure high stability.

Standard Resistors and Load Resistors

Designation	Type	Characteristic Impedance Ω	Frequency Range Mc	Power Rating w	VSWR	Dimensions (mm) or Waveguide Cross-section	Connector	Output Attenuation db	Order Number
SHF Standard Resistor	RMC	50	0–5000	1	< 1.03	44 dia. x 50	Dezifix B	—	BN 33527/50
SHF Standard Resistor	RMC	60	0–5000	1	< 1.03	44 dia. x 50	Dezifix B	—	BN 33527/60
SHF Standard Resistor	RMC	75	0–3000	1	< 1.03	44 dia. x 56	Dezifix B	—	BN 33527/75
UHF Load Resistor	RBD	50	0–2400	2	< 1.08 ¹	48 dia. x 140	Dezifix B ⁴	10 \pm 0.2	BN 33661/50
UHF Load Resistor	RBD	60	0–2400	2	< 1.08 ¹	48 dia. x 140	Dezifix B ⁴	10 \pm 0.2	BN 33661/60
UHF Load Resistor	RBD	50	0–600	20	< 1.10 ²	425 x 105 x 80	Dezifix B ⁴	20 \pm 0.2	BN 33662/50
UHF Load Resistor	RBD	60	0–600	20	< 1.10 ²	425 x 105 x 80	Dezifix B ⁴	20 \pm 0.2	BN 33662/60
UHF Load Resistor	RBD	50	0–2400	20	< 1.10 ¹	115 dia. x 280	Dezifix B ⁴	20 \pm 0.3 ¹	BN 33663/50
UHF Load Resistor	RBD	60	0–2400	20	< 1.10 ¹	115 dia. x 280	Dezifix B ⁴	20 \pm 0.3 ¹	BN 33663/60
UHF Load Resistor	RBD	50	0–600	100	< 1.07 ²	500 x 260 x 200	Dezifix B ⁴	30 \pm 0.2	BN 33664/50
UHF Load Resistor	RBD	60	0–600	100	< 1.07 ²	500 x 260 x 200	Dezifix B ⁴	30 \pm 0.2	BN 33664/60
UHF Load Resistor	RD 010/50	50	0–600	100	< 1.10	520 x 175 x 250	Dezifix B	—	(Type RD 010/50)
UHF Load Resistor	RD 010/60	60	0–600	100	< 1.10	520 x 175 x 250	Dezifix B	—	(Type RD 010/60)
UHF Load Resistor	RD 1/50	50	0–600	1000	< 1.05 ²	1080 x 400 x 370	Dezifix C ⁴	40 \pm 0.2 ²	(Type RD 1/50)
UHF Load Resistor	RD 1/60	60	0–600	1000	< 1.05 ²	1080 x 400 x 370	Dezifix C ⁴	40 \pm 0.2 ²	(Type RD 1/60)
UHF Load Resistor	RD 3/50	50	0–600	3000	< 1.05 ²	400 dia. x 1415	Dezifix C ⁴	50 \pm 0.2 ²	(Type RD 3/50)
UHF Load Resistor	RD 3/60	60	0–600	3000	< 1.05 ²	400 dia. x 1415	Dezifix C ⁴	50 \pm 0.2 ²	(Type RD 3/60)
UHF Load Resistor	RD 10/50	50	0–1000	16,000	< 1.05 ³	2100 x 760 x 400	Dezifix D ⁴	40 \pm 0.2	(Type RD 10/50)
UHF Load Resistor	RD 10/60	60	0–1000	16,000	< 1.05 ³	2100 x 760 x 400	Dezifix D ⁴	40 \pm 0.2	(Type RD 10/60)
UHF-SHF Load Resistor	RC 040/50	50	470–3500	400	< 1.05	65 dia. x 1200	Dezifix C	—	(Type RC 040/50)
UHF-SHF Load Resistor	RC 040/60	60	470–3500	400	< 1.05	65 dia. x 1200	Dezifix C	—	(Type RC 040/60)
UHF-SHF Load Resistor	RC 1/50	50	1500–3500	2000	< 1.1	295 dia. x 840	Dezifix C	—	(Type RC 1/50)
UHF-SHF Load Resistor	RC 1/60	60	1500–3500	2000	< 1.1	295 dia. x 840	Dezifix C	—	(Type RC 1/60)
UHF Load Resistor	RC 10/50	50	470–2300	10,000	< 1.05	500 dia. x 2200	Dezifix D ⁴	50 \pm 0.4 ³	(Type RC 10/50)
UHF Load Resistor	RC 10/60	60	470–2300	10,000	< 1.05	500 dia. x 2200	Dezifix D ⁴	50 \pm 0.4 ³	(Type RC 10/60)
Waveguide Std. Resistor	RBC	—	3200–4900	1	< 1.02	WR 229	Flange	—	BN 334011/229
Waveguide Std. Resistor	RBC	—	4600–7000	1	< 1.02	WR 159	Flange	—	BN 334011/159
Waveguide Std. Resistor	RBC	—	5400–8200	1	< 1.02	WR 137	Flange	—	BN 334011/137
Waveguide Std. Resistor	RBC	—	8200–12,400	1	< 1.02	WR 90	Flange	—	BN 334011/90

¹ Up to 500 Mc. ² Up to 300 Mc. ³ Up to 800 Mc. ⁴ Output with Dezifix B for attenuated power; e.g. for connection of the Microwave Power Meter NRD.

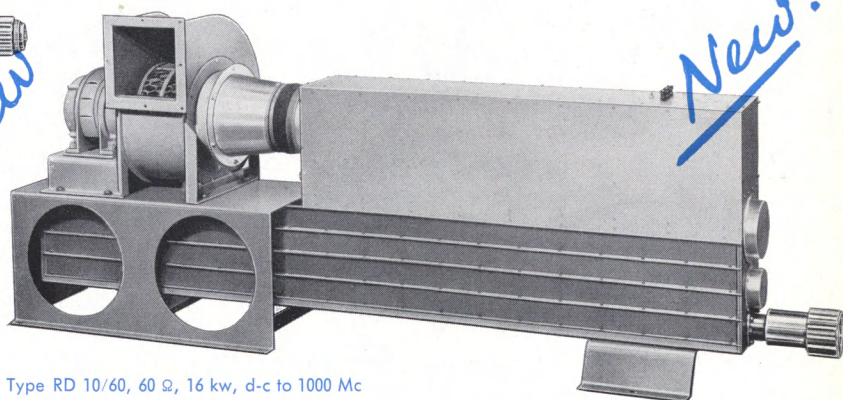


Type RC 040/50, 50 Ω , 400 w, 470 to 3500 Mc

Type RBD BN 33663/60
60 Ω , 20 w, d-c to 2400 Mc



Type RBD BN 33662/50, 50 Ω , 20 w, d-c to 600 Mc



Type RD 10/60, 60 Ω , 16 kw, d-c to 1000 Mc

R&S STANDARD ATTENUATORS, ATTENUATOR PADS, DELAY LINES

Attenuator Boxes and Attenuators

Designation	Type	Characteristic Impedance	Frequency Range	Attenuation	Smallest Increment	VSWR	Accuracy	Max. Input Power	Order Number
Unbal. Std. Attenuator	DPR	60 Ω	0–30 Mc	0–130 db	0.1 db	—	$\pm 1\% \pm 0.05$ db	1.5 w	BN 18014/60
Unbal. Std. Attenuator	DPR	75 Ω	0–30 Mc	0–130 db	0.1 db	—	$\pm 1\% \pm 0.05$ db	1.5 w	BN 18014/75
Unbal. VHF Std. Attenuator	DPR	50 Ω	0–300 Mc	0–100 db	1 db	1.15	$\pm 0.1 \cdots 0.8$ db	0.4 w ²	BN 18042/50
Unbal. VHF Std. Attenuator	DPR	60 Ω	0–300 Mc	0–100 db	1 db	1.15	$\pm 0.1 \cdots 0.8$ db	0.4 w ²	BN 18042/60
Unbal. VHF Std. Attenuator	DPR	75 Ω	0–300 Mc	0–100 db	1 db	1.15	$\pm 0.1 \cdots 0.8$ db	0.4 w ²	BN 18042/75
Unbal. UHF Std. Attenuator	DPU	50 Ω	0–1500 Mc	0–110 db	1 db	1.15	± 0.2 db ⁵	0.4 w ²	BN 18043/50
Unbal. UHF Std. Attenuator	DPU	60 Ω	0–1500 Mc	0–110 db	1 db	1.15	± 0.2 db ⁵	0.4 w ²	BN 18043/60
Unbal. UHF Std. Attenuator	DPU	75 Ω	0–1500 Mc	0–110 db	1 db	1.15	± 0.2 db ⁵	0.4 w ²	BN 18043/75
UHF Standard Attenuator	DPU	50 Ω	0–3000 Mc	0–109 db	1 db	< 1.25	± 0.3 db ⁴	0.4 w ²	BN 18044/50
UHF Standard Attenuator	DPU	60 Ω	0–3000 Mc	0–109 db	1 db	< 1.25	± 0.3 db ⁴	0.4 w ²	BN 18044/60
UHF Attenuator	DPF	50 Ω	0–4000 Mc	5 db	—	< 1.04 ¹	± 0.05 db ¹	0.5 w ³	BN 18060/50
UHF Attenuator	DPF	60 Ω	0–4000 Mc	5 db	—	< 1.04 ¹	± 0.05 db ¹	0.5 w ³	BN 18060/60
UHF Attenuator	DPF	50 Ω	0–4000 Mc	10 db	—	< 1.04 ¹	± 0.1 db ¹	0.5 w ³	BN 18061/50
UHF Attenuator	DPF	60 Ω	0–4000 Mc	10 db	—	< 1.04 ¹	± 0.1 db ¹	0.5 w ³	BN 18061/60
UHF Attenuator	DPF	50 Ω	0–4000 Mc	20 db	—	< 1.04 ¹	± 0.15 db ¹	0.5 w ³	BN 18062/50
UHF Attenuator	DPF	60 Ω	0–4000 Mc	20 db	—	< 1.04 ¹	± 0.15 db ¹	0.5 w ³	BN 18062/60
SHF Variable Attenuator (WR 229)	DPCV	—	3300– 4900 Mc	0.5–40 db	0.1 db	< 1.10	—	1 w	BN 180811/229
do. (WR 159)	DPCV	—	4600– 7000 Mc	0.5–40 db	0.1 db	< 1.10	—	1 w	BN 180811/159
do. (WR 137)	DPCV	—	5400– 8200 Mc	0.5–40 db	0.1 db	< 1.10	—	1 w	BN 180811/137
do. (WR 90)	DPCV	—	8200–12,400 Mc	0.5–40 db	0.1 db	< 1.10	—	1 w	BN 180811/90
do. calib. (WR 229)	DPCV	—	3300– 4900 Mc	0.3–40 db	0.1 db	< 1.10	—	1 w	BN 180911/229
do. calib. (WR 159)	DPCV	—	4600– 7000 Mc	0.5–40 db	0.1 db	< 1.10	—	1 w	BN 180911/159
do. calib. (WR 137)	DPCV	—	5400– 8200 Mc	0.3–40 db	0.1 db	< 1.10	—	1 w	BN 180911/137
do. calib. (WR 90)	DPCV	—	8200–12,400 Mc	0.5–40 db	0.1 db	< 1.10	—	1 w	BN 180911/90

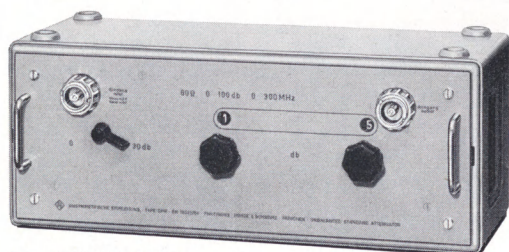
1) At 2400 Mc.

2) Resp. 300 v pulse.

3) Resp. 500 v pulse.

4) At vernier steps.

5) Up to 1000 Mc and 60 db.



Type DPR BN 18042/60
0 to 100 db, 0 to 300 Mc

Type DPF BN 18062/50
20 db, 0 to 4000 Mc

New



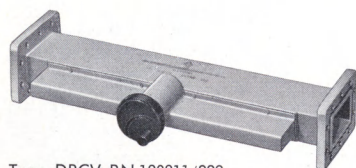
Type DPU BN 18043/75
0 to 110 db, 0 to 1500 Mc



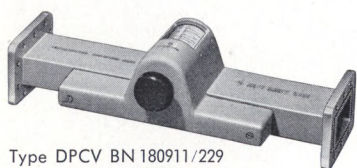
Adjustable Delay Line DLK

The Type DLK is a low-pass type delay network capable of producing a definite time delay between the input and the output signals. The cutoff frequency is between 8 and 50 Mc, depending upon the adjusted delay. The overall range is 0 to 1105 nsec, adjustable in steps of 5 nsec. Accuracy: $\pm 5\%$. Characteristic impedance: 75 Ω . Transmission loss in DC operation: about 0.6 db. R&S Standard Cabinet 35.

► Order Number BN 17920.



Type DPCV BN 180811/229
0.5 to 40 db, 3300 to 4900 Mc



Type DPCV BN 180911/229
0.3 to 40 db, 3300 to 4900 Mc



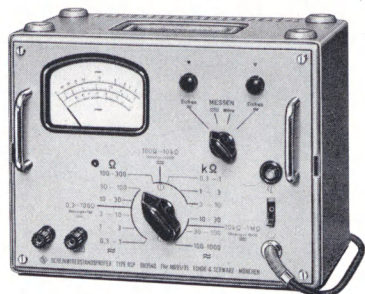
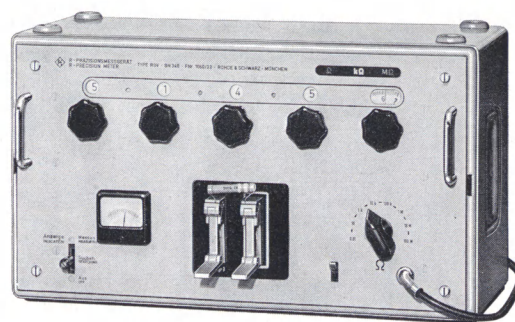
Type DPU BN 18044/60
0 to 109 db, 0 to 3000 Mc

R&S IMPEDANCE METERS, SLOTTED AND NON-SLOTTED LINES

Precision Resistance Meter $\uparrow 10\text{ m}\Omega$ to $100\text{ M}\Omega$ \downarrow Type RGV

The Precision Resistance Meter Type RGV measures resistances between 0.01 and $100\text{ M}\Omega$ making use of a bridge circuit. The accuracy is 0.1% $\pm 1\text{ m}\Omega$ in the range $0.01\text{ }\Omega$ to $10\text{ M}\Omega$ and $\pm 0.5\%$ in the range $10\text{ M}\Omega$ to $100\text{ M}\Omega$. The measurement is made with direct current. The maximum power across the test item being as low as 12 mw , the resistance values even of delicate circuit components may be determined. The Precision Resistance Meter Type RGV combines the high accuracy of conventional bridge circuits with the advantages of a modern design, such as wide measurement range, compact construction, ease of operation, unsensitiveness to vibration. The instrument is designed for AC supply operation. R&S Standard Cabinet 46. ☞

► Order Number BN 340.



Impedance Meter Type RSP $\uparrow 800\text{ CPS}$ \downarrow

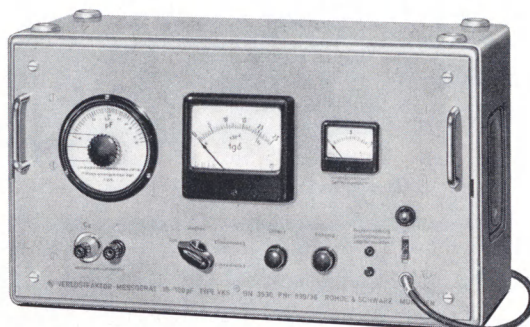
The RSP permits impedance measurements in the audio-frequency region, at 800 cps , and covers the range $0.3\text{ }\Omega$ to $1\text{ M}\Omega$ in 12 sub-ranges. It is suitable, e.g., for determining the impedance of loudspeakers and of input and output transformers. Useful as directly indicating instrument in production measurements. After a simple change-over, the set can be employed for measuring DC resistances of $0.3\text{ }\Omega$ to $1\text{ M}\Omega$. R&S Standard Cabinet 35. ☞

► Order Number BN 3540.

Dissipation-Factor Meter Type VKS $\uparrow 1\text{ MC}$ \downarrow

This instrument is preferably used for dissipation-factor measurements on great numbers of capacitors or dielectric specimens of nearly equal capacitance. The dissipation factor is indicated in terms of parts in 10^4 . $\tan\delta$ range 0 to 25×10^{-4} . Accuracy $\pm 2 \times 10^{-4}$. Test frequency 1 Mc . Accurate tuning is not required prior to each measurement; the capacitance of the test item may deviate $\pm 20\%$ from the adjusted value; as a result, high sorting speed and economy in production tests are obtained. The test result is directly readable. The VKS is also used to advantage, for example, in the chemical industry for routine checking of the composition of liquids by means of dissipation factor measurements. R&S Standard Cabinet 46. ☞

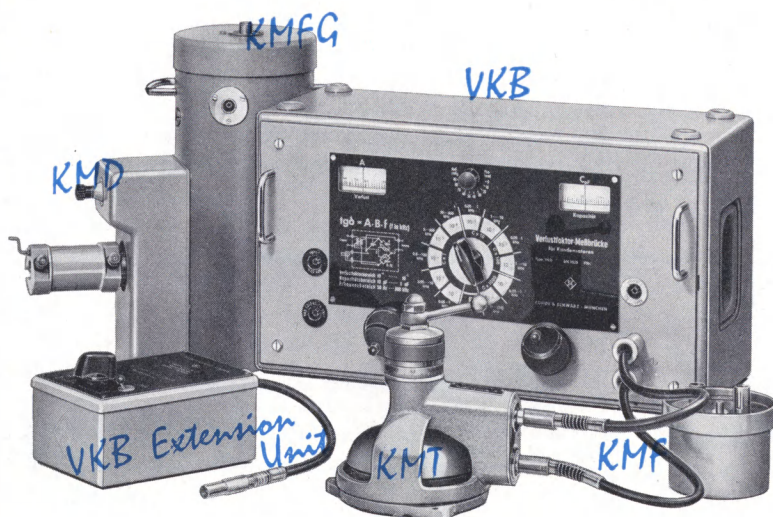
► Range 10 to 100 pf — Order Number BN 3530; range 100 to 1000 pf — BN 3531.



Dielectric Test Bridge Type VKB $\uparrow 10\text{ pF}$ to $1\text{ }\mu\text{F}$, 50 CPS to 300 KC \downarrow

Wide range ($C = 10\text{ pf}$ to $1\text{ }\mu\text{f}$, $\tan\delta = 5$ to 3000×10^{-4}) and high accuracy make for great versatility in dissipation-factor and capacitance measurements. The test frequency is selectable between 50 cps and 300 kc . Suitable voltage source: R&S RC Generator Type SRM; null detector: R&S Tunable Indicating Amplifier Type UBM. Range extension up to $\tan\delta = 1$ possible with VKB Extension Unit. Guard-Ring Capacitor Type KMT for measurement of dielectric constant and dissipation factor of solids; Liquid-Specimen Containers Types KMF and KMFG for investigation of liquids. R&S Standard Cabinet 46. ☞

► Type VKB — Order Number BN 3520; VKB Extension Unit — Order Number BN 35208; Guard-Ring Capacitor Type KMT — Order Number BN 5711; Wire Test Jig Type KMD — Order Number BN 5731; Liquid-Specimen Container Type KMF — Order Number BN 5721/2; Large Liquid-Specimen Container Type KMFG — Order Number BN 5722.

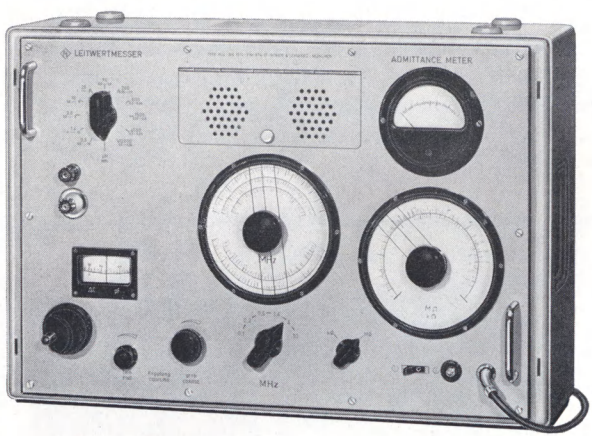
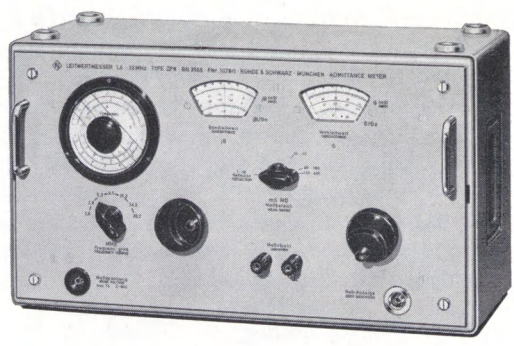


R&S IMPEDANCE METERS, SLOTTED AND NON-SLOTTED LINES / continued

Admittance Meter Type ZPK $\uparrow 1.5$ MC to 30 MC \downarrow

The Type ZPK is designed to determine the admittance of two-terminal networks or the parameters of unbalanced four-terminal networks in the frequency range 1.5 to 30 Mc. The measured result refers to the equivalent shunt circuit, the conductance and susceptance being read on two separate scales. The respective measurement ranges are divided into 4 sub-ranges each, viz.: 0 to 20/60/200/600 mmhos, corresponding to ± 1000 to 1.66Ω . A special balun can be supplied for measurements on balanced items. Reflection coefficient measurements in the range 1 to 100% can be made by comparison of two voltages. An RF voltage source suitable in connection with the ZPK is the R&S Power Signal Generator Type SMLR; the R&S Micro-voltmeter Type USVH is recommended as indicator. R&S Standard Cabinet 46.

► Admittance Meter Type ZPK — Order Number BN 3565; Balun Adapter to ZPK — Order Number BN 35652.



Admittance Meters Types VLU and VLUK $\uparrow 0.1$ to 100 Mc \downarrow

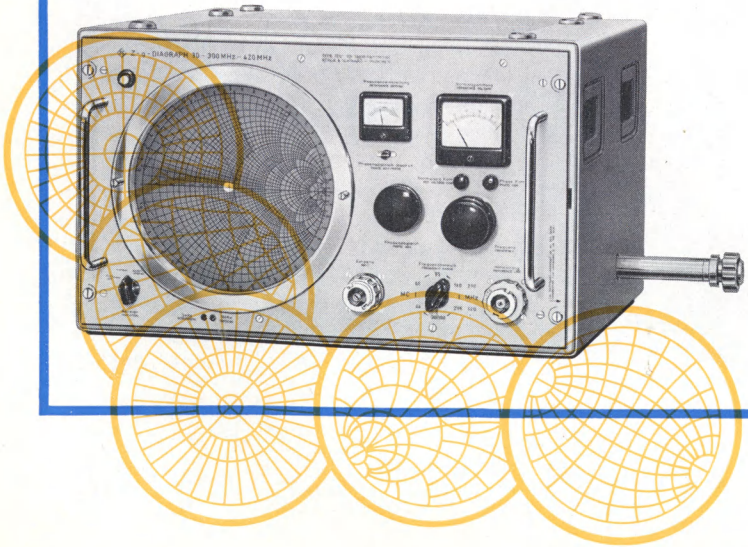
The above two instruments facilitate measuring the resistive and reactive components of admittances. The Type VLU covers the frequency range 0.1 to 10 Mc and measures admittances with a reactive component corresponding to a value between 0 and ± 1000 pf and a resistive component between $1 \text{ k}\Omega$ and $200 \text{ M}\Omega$. The Type VLUK measures admittances with a reactive component corresponding to a value between 0 and ± 100 pf and a resistive component of $1 \text{ k}\Omega$ to $10 \text{ M}\Omega$; it covers the frequency range 10 Mc to 100 Mc. An important example in the wide field of application is the measurement of the losses in components of resonant circuits. The measurement can be made also in wired instruments. This renders it possible to measure losses caused by circuit components, such as switches, valve sockets, shields, etc. Dimensions: $540 \times 370 \times 240 \text{ mm}$.

► VLU Order Number BN 3510; VLUK Order Number BN 3511.

Z-g Diagrams Type ZDU $\uparrow 30$ to 420 MC \downarrow and Type ZDD $\uparrow 300$ to 2400 Mc \downarrow

Direct readings on charts of impedances and transmission parameters with respect to magnitude and phase or resistive and reactive components. Impedance measurements $0.02 Z_0$ to $50 Z_0$, where $Z_0 = 50 \Omega$, 60Ω or 75Ω . Measurements on 4- and multi-terminal networks: Attenuations between 0 and 30 db and phase shifts between 0 and 360° ; range for phase angles between two voltages of the same frequency: 0 to $\pm 180^\circ$. A transistor adapter can be delivered for measurement of transistor parameters in the VHF and UHF ranges. Interchangeable charts ensure ease and speed of recording. ZDU and ZDD may also be used as linear test receivers. Dimensions of both instruments: $540 \times 340 \times 480 \text{ mm}$.

- Order Numbers of the different models and their accessories:
- | | |
|---|---|
| Type ZDU, 30 to 420 Mc, 50- Ω model | Order No. BN 35610/50 |
| Type ZDU, 30 to 420 Mc, 60- Ω model | Order No. BN 35610/60 |
| Type ZDU, 30 to 420 Mc, 75- Ω model | Order No. BN 35610/75 |
| Type ZDD, 300 to 2400 Mc, 50- Ω model | Order No. BN 3562/50 |
| Type ZDD, 300 to 2400 Mc, 60- Ω model | Order No. BN 3562/60 |
| 4-Terminal Feed Unit for ZDU/ZDD, 50 Ω | Order No. BN 35615/550 |
| 4-Terminal Feed Unit for ZDU/ZDD, 60 Ω | Order No. BN 35614/660 |
| 4-Terminal Feed Unit for ZDU/ZDD, 75 Ω | Order No. BN 35615/880 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 50 Ω , 1 m | BN 35613/50/1 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 50 Ω , 2 m | BN 35613/50/2 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 50 Ω , 5 m | BN 35613/50/5 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 60 Ω , 1 m | BN 35612/1 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 60 Ω , 2 m | BN 35612/2 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 60 Ω , 5 m | BN 35612/5 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 75 Ω , 1 m | BN 35613/80/1 |
| Two 2-Term. Meas. Cables for ZDU/ZDD, 75 Ω , 2 m | BN 35613/80/2 |
| Transistor Adapter with Accessories, 50- Ω model | BN 35616/50 |
| Transistor Adapter with Accessories, 60- Ω model | BN 35616/60 |
| Coaxial DC Supply, 30 to 1000 Mc, 50- Ω model | BN 35616-2/50 |
| Coaxial DC Supply, 30 to 1000 Mc, 60- Ω model | BN 35616-2/60 |
| Coaxial DC Supply, 300 to 3000 Mc, 50- Ω model | BN 35616-3/50 |
| Coaxial DC Supply, 300 to 3000 Mc, 60- Ω model | BN 35616-3/60 |
| 100 Charts each | BN 35611/1657, BN 35611/1658, BN 35611/1659, BN 35611/1709, BN 35611/2692; Transm.-Line Chart Calc. BN 35611. |



Q Meter Type QVH \uparrow 50 KC to 30 MC \downarrow

The Q Meter Type QVH measures the Q of coils with inductances of 1 μ h to 100 mh in the frequency range from 50 kc to 30 Mc. It covers a Q range of 5 to 600 in 3 sub-ranges. The instrument contains a test circuit capacitance which can be adjusted to any value between 50 pf and 12,000 pf and which permits a coil to be tested over a frequency range of about 1:15, so that an extensive Q characteristic can be plotted if the need arises. The Type QVH is furthermore useful for a number of measurements. Further examples of application are the determination of the dissipation factor of capacitors and of the dielectric constant and the dissipation factor of liquids. These measurements are of particular interest in the above frequency range. R&S Standard Cabinet 46. ⚡

► Order Number BN3672.



Impulse Reflectometer Type ZUPI \uparrow Bands I, II, III \downarrow

Used for investigating reflections on cables by pulse-modulated carrier frequencies under operating conditions. It applies VHF pulses of 0.1- μ sec duration and 50-kc repetition frequency to the test item and receives the pulses reflected by discontinuities. The incident and reflected pulses are displayed on an oscilloscope with sufficient band-width. The measurable amplitude of the reflected pulse lies between 0.6 and 100 % of the incident pulse. The reflections are located with the oscilloscope. Measurement range: 50 to 2000 m electrical length; resolvable distance: 15 m electrical length. Frequency ranges: 47 to 68 Mc, 81 to 102 Mc, 174 to 223 Mc. Besides carrier pulses also DC pulses may be used for measuring, e.g., determination of the characteristic impedance of cables which can be determined within a few per cent using the built-in resistor and within a few tenths of one per cent using an external precision resistor. Band-stop filters serve to reject interfering signals, low-pass filters to suppress harmonics, and extension cables enable the fault-localization range to be extended towards lower values. R&S Standard Cabinet 510. ⚡

► Order Numbers: Type ZUPI, 50 Ω – BN35683/50; 60 Ω – BN35683/60. VHF Band-Stop Filter 87 to 100 Mc for 50 Ω – BN356811/50; for 60 Ω – BN356811/60. Low-Pass Filter Band I, 50 Ω – BN356813/I/50; Band I, 60 Ω – BN356813/I/60; Band II, 50 Ω – BN356813/II/50; Band II, 60 Ω – BN356813/II/60; Band III, 50 Ω – BN356813/III/50; Band III, 60 Ω – BN356813/III/60. Extension cable for 50 Ω , 35 m – BN356812/50; for 60 Ω , 40 m – BN356812/60.

Reflectometer Type ZUP \uparrow 10 to 600 MC \downarrow

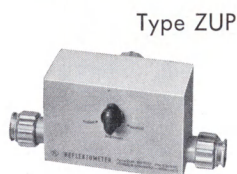
The instrument provides for accurate determination of the reflection coefficient or the matching of loads to a coaxial line. Frequency range 10 to 600 Mc. Reflection coefficient range 1 to 100 %. Impedance range 0.1 to 10 Z_0 , where Z_0 is 50 Ω , 60 Ω or 75 Ω . 3 Dezifix B connectors; dimensions: 220 x 100 x 110 mm. ⚡

► Order Numbers: Reflectometer Type ZUP for 50 Ω – BN3569/50; Type ZUP for 60 Ω – BN3569/60; Type ZUP for 75 Ω – BN3569/75.

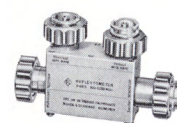
Reflectometer Type ZDP \uparrow 300 to 4200 MC \downarrow

The Reflectometer Type ZDP serves for the rapid determination of the reflection coefficient or of the mismatch between a load and a source of energy. Frequency range: 300 to 4200 Mc. Reflection coefficient range: 2 to 100 %. Residual VSWR: less than 1.05. 4 Dezifix B connectors. The dimensions are 165 x 95 x 40 mm. ⚡

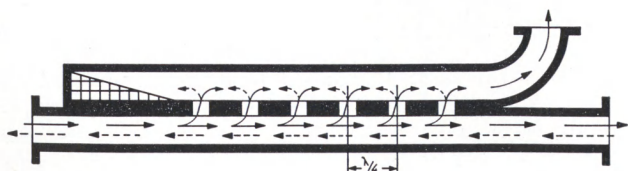
► Order Numbers: Type ZDP, 50 Ω – BN35691/50; Type ZDP, 60 Ω – BN35691/60.



Type ZUP



Type ZDP



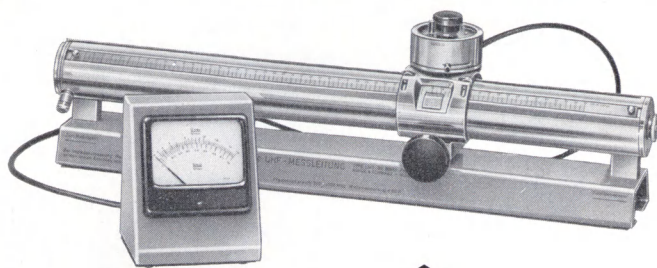
SHF Directional Coupler Type ZCP \uparrow 3600 to 12,400 MC \downarrow

Extracts a portion of the energy flowing in one direction of a waveguide, the amount depending on the coupling attenuation. The directivity is greater than 45 or 40 db; coupling attenuation 20 db. Flanges and cross-sections corresponding to IEC and RMA Stds. ⚡

► Order Numbers: 3600 to 4900 Mc – BN35711/229. 4900 to 7000 Mc – BN35711/159. 5800 to 8200 Mc – BN35711/137. 8200 to 12,400 Mc – BN35711/90.



R&S IMPEDANCE METERS, SLOTTED AND NON-SLOTTED LINES/continued



VHF Slotted Line Type LMM and UHF Slotted Line LMD

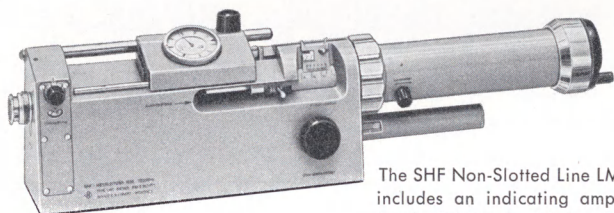
The slotted line is the simplest instrument for measuring wavelengths and for determining impedances. The VHF Slotted Line Type LMM, which has a length of 2 m, is designed for the frequency range 80 to 300 Mc, the UHF Slotted Line Type LMD for the frequency range 300 to 3000 Mc.

► Order Numbers: VHF Slotted Line LMM, 50 Ω – BN 3916/50; 60 Ω – BN 3916/60; 75 Ω – BN 3916/75. UHF Slotted Line LMD, 50 Ω – BN 3926/50; 60 Ω – BN 3926/60; 75 Ω – BN 3926/75.

SHF Non-Slotted Line Type LMC \uparrow 1650 to 7450 MC \downarrow

This non-slotted line allows measurements of VSWR on match-terminated lines as well as resonance measurements on lines terminated with reactive loads, e.g., when testing dielectric materials, without causing any changes on the line.

► Order Numbers: 1650 to 6350 Mc, 50 Ω – BN 3931/50; 1650 to 6950 Mc, 60 Ω – BN 3931/60; 1650 to 7450 Mc, 75 Ω – BN 3931/75. Replacement pistons and inner conductors can be supplied for 50, 60 and 75 Ω .



The SHF Non-Slotted Line LMC includes an indicating amplifier in R&S Standard Cabinet 35.

Material Characteristics Test Assembly \uparrow 80 to 7000 MC \downarrow

For exact determination of electromagnetic material characteristics of solids and liquids between -60 and $+240^\circ\text{C}$.

► The complete assembly comprises: 1 Base Plate Order Number BN 39310 for Non-Slotted Line LMC or Slotted Line LMD. 1 Non-Slotted Line LMC or 1 Slotted Line LMD, depending on frequency. 1 Container BN 39319/50 or /60 for measurements on solids and liquids up to 7000 Mc between -60 and $+240^\circ\text{C}$, consisting of 2 coaxial specimen containers with temperature-control jacket, usable lengths resp. 5 cm and 20 cm, 2 coaxial temperature isolators, temperature-controllable short-circuit sections with inner conductor for 50 or 60 Ω . Temperature is maintained by circulating liquid. 1 Short-Circuit Specimen Container BN 39318/50 or /60. For 80 to 1200 Mc, 1 Calibrated Adjustable Short BN 39592/50 or /60 (from 80 to 160 Mc, in addition 1 Extension Line BN 3972/50 or /60); 1 U/Z Corner BN 3973/50 or /60; for 1200 to 7000 Mc, 1 Calibrated Adjustable Short BN 39591/50 or /60.

R&S MEASURING INSTRUMENTS

Phase & Level Meter Type PDF \uparrow 10 CPS to 50 MC \downarrow

The Phase & Level Meter Type PDF permits determination of the transmission characteristics of 4-terminal networks by simultaneously measuring attenuation and phase between input and output voltages at 10 cps to 50 Mc. The set consists of the Frequency Converter Type UFF, Twin Voltmeter Type UDF and Phase Meter Type PZN. A suitable generator, e.g., the Type SBF, SMLR or SMLM, supplies the test voltage. Test frequencies above 100 kc are converted to an IF of 30 kc using the frequency converter with its high input impedance which can be reduced to any conventional value by plug-in terminating resistors. The twin voltmeter indicates the voltage across the input and the output of the test item on two separate meters and amplifies the voltages for the phase meter, which gives a direct reading of the phase difference. The above mentioned instruments can also be used separately.

► Order Number of the Type PDF – BN 19450, consisting of the following instruments: Frequency Converter Type UFF, R&S Standard Cabinet 56 – BN 19452; Twin Voltmeter Type UDF, R&S Standard Cabinet 55 – BN 19451; Phase Meter Type PZN, R&S Standard Cabinet 56 – BN 1941.



Phase Meter Type PZN \uparrow 10 CPS to 500 KC \downarrow

This direct indicating instrument measures phase angles between two coherent AC signals. Ranges: 0° to $45^\circ/90^\circ/180^\circ/360^\circ$ and 180° to $225^\circ/270^\circ/360^\circ$. Sensitivity: 0.1 to 25 V_{rms} and 2.5 to 250 V_{rms} , switchable. R&S Standard Cabinet 56.

► Order Number BN 1941.

SHF Visual-Display Sweep Generator Assembly Type ZWC \uparrow 1000 to 4700 MC \downarrow

Provides for rapid and easy measurement of the swept-frequency behaviour of reflections in 2-terminal networks and of the input reflection and attenuation of 4-terminal networks. Swept-frequency operation in a wide range and display of the frequency response of two quantities for easy evaluation. It is possible to calibrate the frequency axis by superimposing two markers on the curves and to accurately adjust these markers independently from each other. The ZWC comprises the Carcinotron-type sweep signal generator SMC for the desired frequency range (pages 18/19 and 20), the Display Unit with the corresponding frequency range (adjustable also by exchanging the Frequency Marker Generator Plug-in Unit), a directional coupler assembly, the UHF Attenuator DPF, the SHF Standard Resistor RMC. For microwave measurements waveguide-to-coaxial adapters, waveguide couplers and waveguide load resistors are required. Attenuation measurement ranges: 0 to 14 db, 10 to 24 db, 20 to 34 db; in addition, for waveguide measurements: 30 to 44 db. Reflection coefficients: from 0 to 3%, 0 to 10%, 0 to 30%, 0 to 100%.

FOR TRANSMISSION PARAMETERS



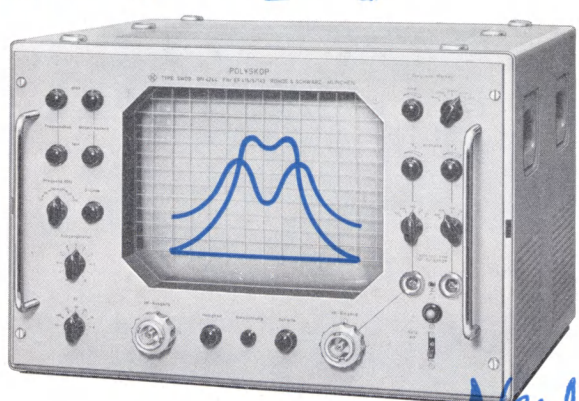
Videoskop $\uparrow 100$ KC to 10 MC \downarrow Type SWOF

A swept-frequency visual display unit particularly useful in television engineering for displaying and measuring the frequency response of 4-terminal networks. Screen size: 180×240 mm. Frequency markers are provided at 500-kc and 1-Mc points. The cabinet dimensions are $540 \times 338 \times 575$ mm. ⚡

► Order Numbers: Type SWOF BN 4241; SWOF Camera Adapter BN 42410.

Side-Band Adapter for Videoskop. Permits the spectral energy distribution over the two side-bands of a television transmitter to be displayed simultaneously on the Videoskop screen. This gives a rapid survey of the entire transmission characteristic as a function of modulation depth, and of the required suppression of the lower side-band. R&S Standard Cabinet 53. ⚡

► Order Numbers: Bands I and III, 50 Ω – BN 42411/50; do 60 Ω – BN 42411/60; Bands IV and V, 50 Ω – BN 42415/50; do 60 Ω – BN 42415/60.

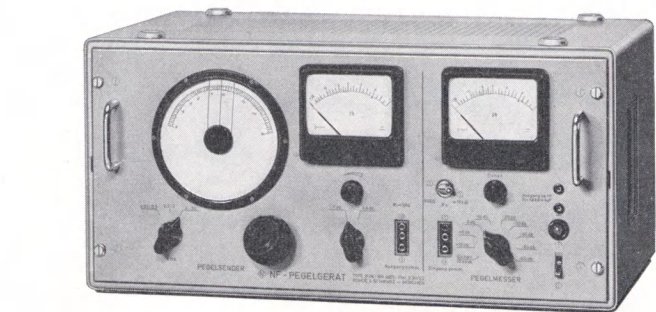


New

Polyskop $\uparrow 0.5$ to 400 MC or 1200 MC \downarrow Type SWOB

A two-channel frequency-response visual display unit affording simultaneous display and measurement of two separate quantities as a function of frequency. The Polyskop I supplies a centre frequency adjustable between 0.5 and 400 Mc and frequency-modulated with a width of ± 0.2 to ± 50 Mc in step with the AC power supply. The Polyskop II delivers a centre frequency up to 1200 Mc, its sweep width at 1200 Mc being adjustable from ± 0.3 to ± 50 Mc. The output voltage of 0.5 v max. when terminated with Z_0 is adjustable in 1-db steps with 70-db attenuator (40 db above 800 Mc). The display section with a 36-cm picture tube has 2 independent identical channels of adjustable gain. Inputs: Coaxial RF input with termination and meter diode; two RF diode probes; two Y-amplifier inputs. Voltage requirement for full picture height: about 30 to 50 mv for the RF inputs, 2 mv for the Y-amplifier inputs. Frequency markers generated in the instrument are without effect on the item under test. By connecting the Selektomat Type USWV (see page 5), the attenuation measurement range of 45 db can be extended and the discrimination for attenuation variations of the test item increased. The Dimensions of both instruments are: $540 \times 370 \times 575$ mm. ⚡

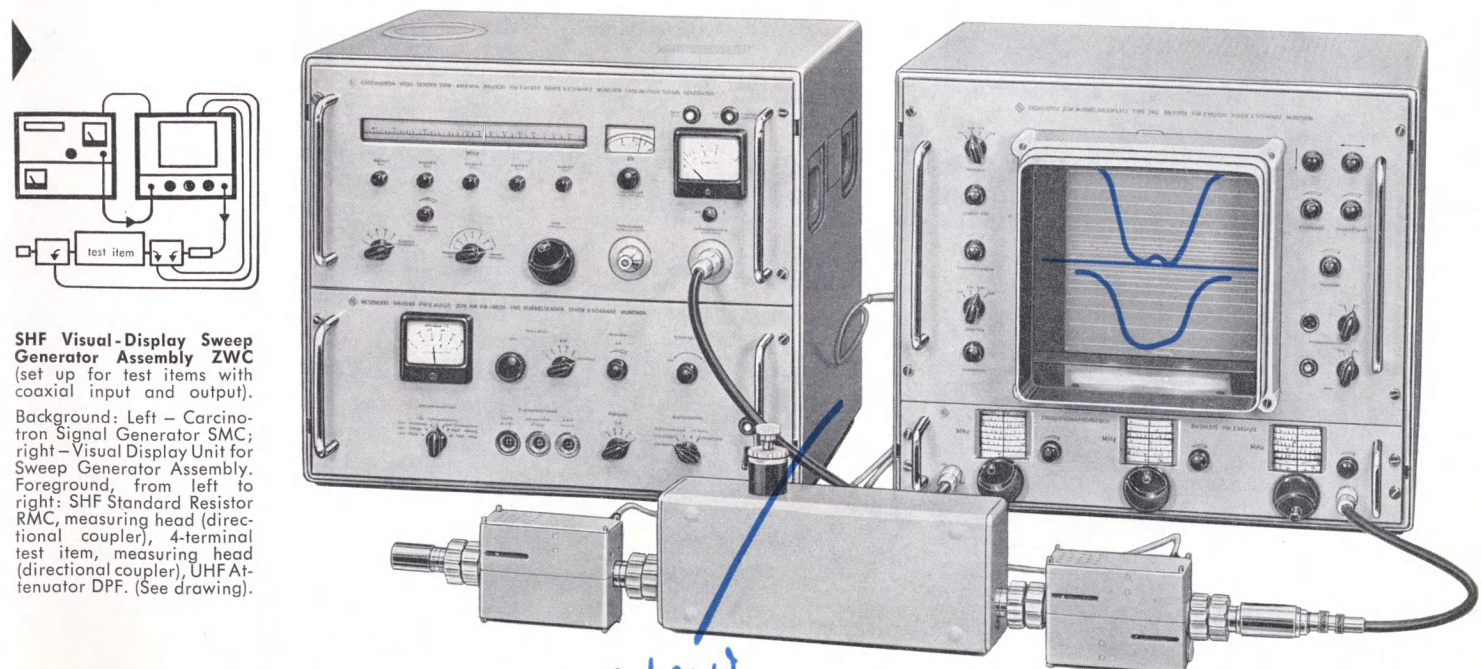
► Order Numbers: Polyskop I, 50 Ω – BN 4244/50; Polyskop I, 60 Ω – BN 4244/60; Polyskop I, 75 Ω – BN 4244/75. Polyskop II, 50 Ω – BN 4245/50; Polyskop II, 60 Ω – BN 4245/60. T-section 50 Ω – BN 42441/50; do 60 Ω – BN 42441/60; do 75 Ω – BN 42441/75. SWOB Camera Adapter BN 42442.



AF Transmission Measuring Set $\uparrow 30$ CPS to 30 KC \downarrow Type SUN

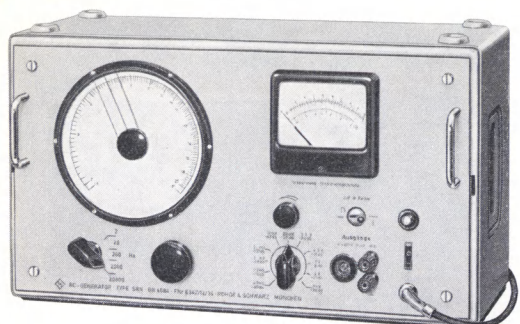
A transmission measuring set comprised of an RC oscillator (EMF -80 to $+22$ db for BN 40871 or -20 to $+8$ db for BN 40872, distortion less than 0.1%, S/N ratio greater than 66 db) and of a millivoltmeter (-80 to $+22$ db for BN 40871 or $+14$ db for BN 40872). Model BN 40871 is a laboratory instrument with balanced and unbalanced output and input. Model BN 40872 is a special version with balanced output and input for broadcasting stations. Both models are also available with a switching and filter panel for measuring the harmonic distortion of four-terminal networks at frequencies of 40 cps, 1 kc, 5 kc and 15 kc. ⚡

► Order Number Type SUN (general), R&S Standard Cabinet 57 – BN 40871; do with Switching and Filter Panel, R&S Standard Cabinet 510 – BN 408710. Type SUN (broadcasting), R&S Std. Cabinet 57 – BN 40872; do with Switching and Filter Panel, R&S Std. Cabinet 510 – BN 408720.

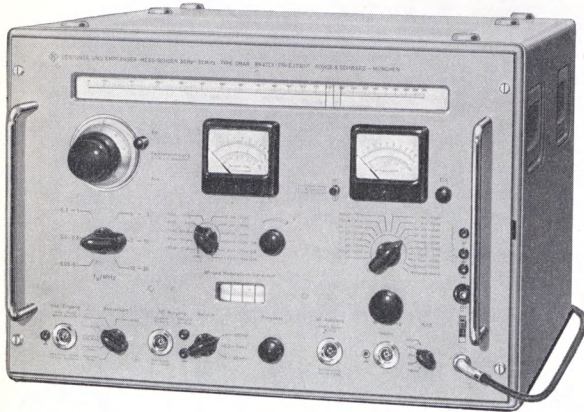


SHF Visual-Display Sweep Generator Assembly ZWC (set up for test items with coaxial input and output).
Background: Left – Carcination Signal Generator SMC; right – Visual Display Unit for Sweep Generator Assembly.
Foreground, from left to right: SHF Standard Resistor RMC, measuring head (directional coupler), 4-terminal test item, measuring head (directional coupler), UHF Attenuator DPF. (See drawing).

New

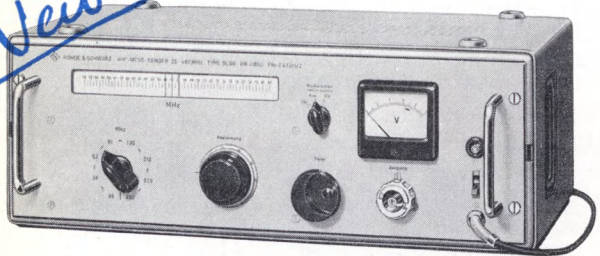


RC Generator 2 cps to 20 kc Type SRN

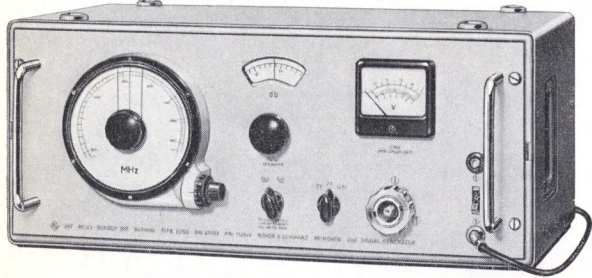


Power & Standard Signal Generator 30 cps to 31 Mc Type SMAR

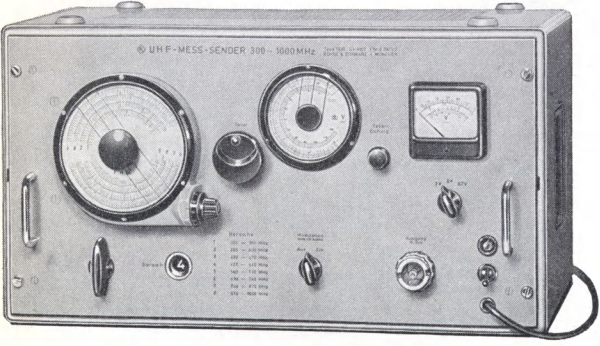
New



VHF Signal Generator 25 to 480 Mc Type SLSV



UHF Signal Generator 300 to 940 Mc Type SLSD



UHF Signal Generator 300 to 1000 Mc Type SDR

R&S OSCILLATORS, SIGNAL GENERATORS

Frequency range	Type	Designation	Open-circ. V. Output power	Output impedance
2 cps — 20 kc	SRN	RC Generator	10 μ v-3 v/0-30 v	600 Ω /0-25 k Ω
20 cps — 20 kc	SIT	Beat-Frequency Oscillator	0.1 mv-2 v, 1 w into 150, 600 Ω , 7 k Ω	20, 60, 100, 200, 300, 600 Ω , 1 k Ω /—
30 cps — 300 kc	SRM	RC Generator	max. 1 v/max. 30 v	600 Ω /100 Ω
10 cps — 1 Mc	SRB	RC Oscillator	0.1 mv-30 v/1.5 w	50, 60, 75, 200, 600 Ω
10 cps — 10 Mc	SBF	Wide-Band Signal Gen.	0.1 μ v-3 v/0-10 v	75 Ω /300 Ω
0.1 — 30 Mc	SMLR	Power Signal Generator	1 μ v-3 v/max. 10 v	60 Ω /—
30 cps — 30 kc	SMAR	Power & Standard Signal Generator	30 μ v-3 v/5 v 0.03 μ v-10 v * across 60 Ω	600 Ω /10 k Ω 50, 60, 75, 150, 600 Ω
30 kc — 31 Mc				
4 — 300 Mc	SMAF	Standard Signal Generator for AM, FM & TV	0.05 μ v-50 mv *	60 Ω
30 — 300 Mc	SMLM	Power Signal Generator	max. 3 v *	60 Ω
25 — 480 Mc	SLSV	VHF Signal Generator	3.5 mv-3.5 v	—
do.	do.	do.	do.	do.
170 — 940 Mc	SDAF	UHF Standard Signal Generator for AM, FM & TV	1 μ v-450 mv	50 Ω
do.	do.	do.	do.	60 Ω
do.	do.	do.	do.	75 Ω
300 — 940 Mc	SLSD	UHF Signal Generator	1 mv-1.8 v	50 Ω
do.	do.	do.	1 mv-2 v	60 Ω
do.	do.	do.	do.	75 Ω
300 — 1000 Mc	SDR	UHF Signal Generator	1 μ v-3.5 v	50 Ω
do.	do.	do.	1 μ v-4 v	60 Ω
do.	do.	do.	do.	75 Ω
1000 — 1900 Mc	SCR	UHF Signal Generator	1 μ v-2.7 v, over 1500 Mc max. 1.8 v	50 Ω
do.	do.	do.	1 μ v-3 v, over 1500 Mc max. 2 v	60 Ω
1700 — 2700 Mc	SBR	UHF Signal Generator	1 μ v-2 v	50 Ω
do.	do.	do.	do.	60 Ω
275 — 2750 Mc	SLRD	UHF Power Signal Gen.	10 w-20 w-1 w	50 Ω ***
do.	do.	do.	do.	60 Ω ***
2700 — 4200 Mc	SAR	SHF Signal Generator	5 μ v-3.4 v, over 3600 Mc max. 2 v	50 Ω
do.	do.	do.	as for 50 Ω	60 Ω
1000 — 2000 Mc	SMC	Carcinotron Signal Gen.	max. 100-800 mw	50 Ω ***
1600 — 3200 Mc	do.	do.	max. 100-600 mw	50 Ω ***
2400 — 4700 Mc	do.	do.	max. 100-600 mw	50 Ω ***
1700 — 5000 Mc	SMCK	SHF Signal Generator	max. 3-120 mw	50 Ω ***
4400 — 8300 Mc	do.	do.	max. 30-120 mw	50 Ω ***
8000 — 11,400 Mc	do.	do.	max. 15-70 mw	50 Ω ***

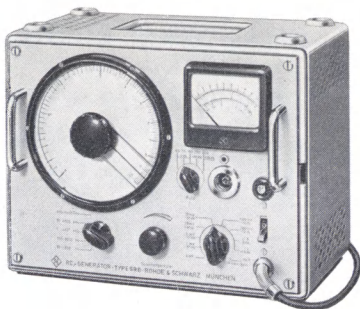
* Output voltage holds for match-termination unless specified for a particular termination.

AND MODULATORS

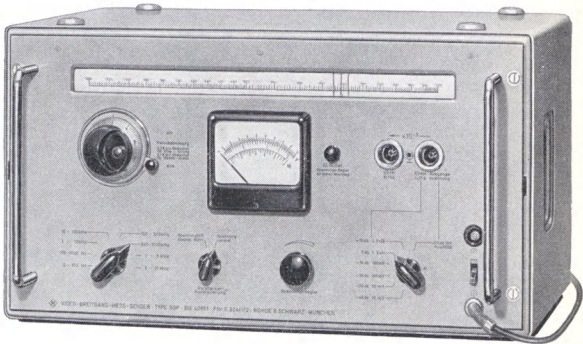
Modulation Type	Depth/Dev.	Modulation frequency Internal	External	Miscellaneous (k = distortion)	R&S Standard Cabinet	Order Number
—	—	—	—	$k < 1\%$	46	BN 4084
—	—	—	—	$k < 2\%$	47	BN 40341
—	—	—	—	up to 100 kc $k < 1\%$ over 100 kc $k < 2\%$	46	BN 4085
—	—	—	—	low distortion flat freq. response	35	BN 40851
—	—	—	—	low distortion	581	BN 40861
AM 30 % AM 0-90 %	— —	1 kc —	— 0.03-10 kc	$k < 2\%$	56	BN 41001
—	—	—	—	$k < 0.2\%$	—	BN 4123
AM 0-100 %	—	0.03-15 kc	0.03-15 kc	crystal control of oscillator frequency	—	BN 4123
AM 0-80 % FM 0-100 kc	— —	1 kc 1 kc	0.03-100 kc 0.03-20 kc	Video: Ext. 0-6.5 Mc AM and/or FM	58	BN 41404
AM 80 % AM 0-80 %	— —	1 kc —	— 0.03-200 kc	Output atten. 60 db	46	BN 4105
AM 100 % square wave	—	1 kc	—	Output atten. 60 db	55	BN 41002/50 ★
do.	do.	do.	do.	do.	do.	BN 41002/60 ★
AM 0-90 % FM 0-100 kc	— —	1 kc (60 %) 1 kc	3 cps-6.5 Mc 0.03-20 kc	AM and/or FM	581	BN 41023/2/50
as for 50 Ω	as for 50 Ω	as for 50 Ω	as for 50 Ω	do.	do.	BN 41023/2/60
as for 50 Ω	as for 50 Ω	as for 50 Ω	as for 50 Ω	do.	do.	BN 41023/2/75
AM 100 %	—	1 kc**	—	Triode oscillator with cap. tuning	56	BN 41003/50
do.	do.	do.	do.	do.	do.	BN 41003/60
do.	do.	do.	do.	do.	do.	BN 41003/75
AM 100 %	—	1 kc**	—	do.	58	BN 41022/50
do.	do.	do.	do.	do.	do.	BN 41022/60
do.	do.	do.	do.	do.	do.	BN 41022/75
AM 100 %	—	1 kc**	—	do.	58	BN 41026/50
do.	do.	do.	do.	do.	do.	BN 41026/60
AM 100 %	—	1 kc**	—	do.	58	BN 41027/2/50
do.	do.	do.	do.	do.	do.	BN 41027/2/60
AM 100 %	—	1 kc**	—	Output atten. 80 db	—	BN 41004/50
do.	do.	do.	do.	do.	do.	BN 41004/60
AM 100 %	—	1 kc**	—	Triode oscillator with cap. tuning	57	BN 41029/50
do.	do.	do.	do.	do.	do.	BN 41029/60
AM: 100 % Sweeping: 0-full range FM: Max. dev. at lower or upper limit frequency f/15 - f/30 or f/180 - f/360	— — — —	1 kc**, 50 kc** 10 cps 10 cps	10 cps-3 Mc 10-100 cps 10 cps-3 Mc	The specifications listed to the left hold for all three models. See also page 20.	— — —	BN 410300 BN 410310 BN 410320
PM: 0.2 μsec to 20 msec FM	— — —	1 kc** — —	30 cps-2 Mc — 15 cps-30 Mc	The specifications listed to the left hold for all three models. See also page 20.	512 512 512	BN 410420 BN 410430 BN 410440

** Square-wave voltage.

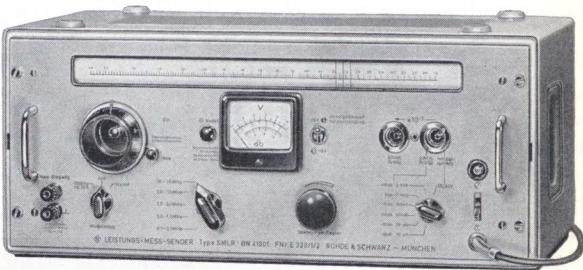
*** Characteristic impedance at the output.



RC Oscillator 10 cps to 1 Mc Type SRB



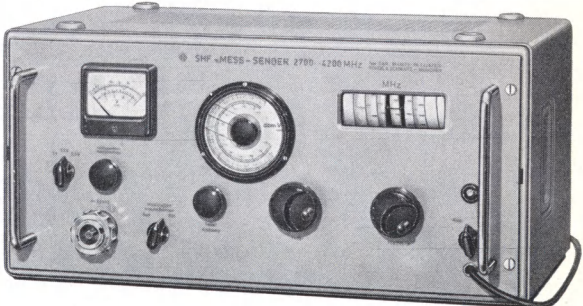
Wide-Band Signal Generator 10 cps to 10 Mc Type SBF



Power Signal Generator 0.1 to 30 Mc Type SMLR

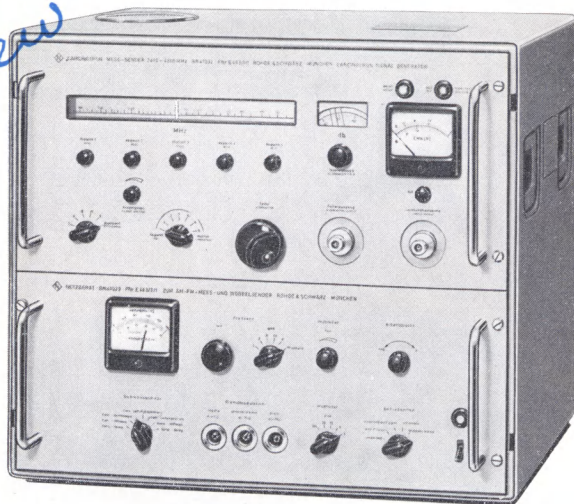


UHF Power Signal Generator 275 to 2750 Mc Type SLRD



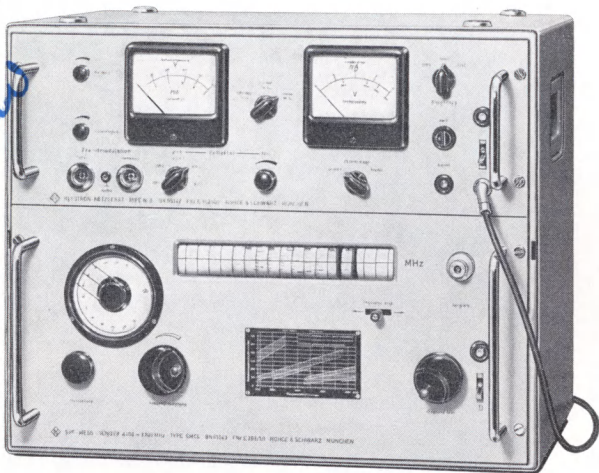
SHF Signal Generator 2700 to 4200 Mc Type SAR

New



Carcinotron Signal Generators 1000 to 4700 Mc Type SMC (see p. 18/19). They combine the functions of a power signal generator, broadband sweep signal generator and AM-FM signal generator, and are comprised of the basic unit and various plug-in generator chassis for the different ranges. Dimensions of the complete unit: 548x540x506 mm. ▶ Order Numbers: Type SMC (complete), 1000 to 2000 Mc – BN 410300; do 1600 to 3200 Mc – BN 410310; do 2400 to 4700 Mc – BN 410320. Carcinotron generator chassis 1000 to 2000 Mc – 41030; do 1600 to 3200 Mc – BN 41031; do 2400 to 4700 Mc – BN 41032.

New



SHF Signal Generator 1700 to 11,400 Mc Type SMCK (see p. 18/19). Klystron type generator of high output power, high frequency and amplitude stability, and square-wave modulation free from incidental frequency modulation. Basic unit with plug-in klystron units. Dimensions of the entire unit: R&S Standard Cabinet 512. ▶ Order Numbers: Type SMCK (complete), 1700 to 5000 Mc – BN 410420; do 4400 to 8300 Mc – BN 410430; do 8000 to 11,400 Mc – BN 410440. SHF Signal Generator Plug-in Unit, 1700 to 5000 Mc – BN 41042; do 4400 to 8300 Mc – BN 41043; do 8000 to 11,400 Mc – BN 41044.

UHF AM Modulator MAD

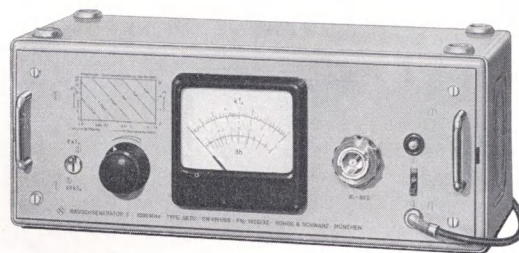
The instrument serves for the amplitude modulation of signal generators in the UHF range and is principally used for television modulation. It is, however, equally well suited for modulation with sine waves, square waves, pulses or other currents from 0 to 20 Mc in the case of carriers in the frequency



range of from 170 to 1500 Mc. The permissible carrier voltage is 2 v open circuit, the modulation voltage is 1.5 v_{pp}. R&S Standard Cabinet 35. ▶ Order Number for 50 Ω – BN 4191/50; for 60 Ω – BN 4191/60.

Noise Generator 30 CPS to 6 MC Type SUF

It delivers a continuous noise spectrum in the switch-selected ranges 30 cps to 20 kc, 30 cps to 600 kc and 30 cps to 6 Mc. The maximum output voltage is 1 v_{rms} across 75 Ω. The output voltage is adjustable continuously and in steps with the aid of the calibrated attenuator of 100 db maximum attenuation. The voltage indication is given on a panel meter. The Noise Generator Type SUF is a versatile special signal generator which has contributed valuable measurement methods to audio-frequency, multi-channel carrier-, and video-frequency engineering. R&S Standard Cabinet 56. ▶ Order Number BN 4150.



Noise Generator 3 to 1000 MC Type SKTU

The Noise Generator Type SKTU supplies a measurable and adjustable continuous noise spectrum. Noise power indication by meter calibrated directly in KT₀ and db. The set permits, e.g., the sensitivity of receivers to be measured rapidly and conveniently within wide frequency ranges. 3 models with the same noise spectrum coverage but different source impedances (50, 60 or 75 Ω). VSWR less than 1.1. R&S Standard Cabinet 45. ▶ Order Number for source impedance 50 Ω, noise power 0 to 32 kT₀ or 0 to 15 db – BN 4151/2/50. Order Number for source impedance 60 Ω, noise power 0 to 40 kT₀ or 0 to 16 db – BN 4151/2/60. Order Number for source impedance 75 Ω, noise power 0 to 32 kT₀ or 0 to 15 db – BN 4151/2/75.

Coaxial UHF Noise Generator 475 to 3000 MC Type SKTD

Available noise power: 69 kT₀ ± 3 kT₀ (18.4 db ± 0.2 db). Designed as a noisy 4-terminal network. In 2-terminal connection, noise figures from 1 to 100 kT₀ can be measured. Dimensions: length 700 mm, height 85 mm. R&S connector Dezifix B. The power supply is a separate unit housed in an R&S Standard Cabinet 35. ▶ Order Number 50 Ω – BN 4152/50; 60 Ω – BN 4152/60.

Coaxial SHF Noise Generator 1500 to 6000 MC Type SKTC

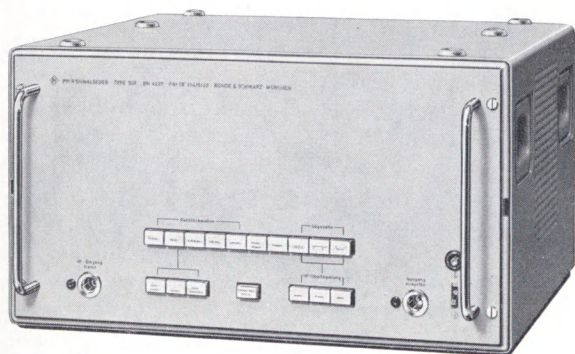
Frequency range: 1500 to 6000 Mc. Available noise power: 69 kT₀ ± 3 kT₀ or 18.4 db ± 0.2 db. Designed as a noisy 4-terminal network. In 2-terminal connection using a terminating resistor, noise figures from 1 to 100 kT₀ can be measured. Length 700 mm, height 85 mm. The power supply is a separate unit housed in an R&S Standard Cabinet 35. ▶ Order Number 50 Ω – BN 4153/50; 60 Ω – BN 4153/60.



TV Channel Signal Generator Type SBTF ♦ Bands I and III ♦

The signal generator delivers radio-frequency vision and sound signals in one of the channels of Band I or Band III. It is designed for measurements on TV receivers, but can also be used for the transmission of programmes. The quality of the signals complies with the recommendations of the standards of the German broadcasting corporations. A delay-equalizing network in conjunction with a standard monitor ensures excellent transmission of the step function. Change of channels by change of crystals and trimming. Vision output power: 0.5 w; vision-to-sound power ratio: 1:5. With a modified model set-ups for the generation of a signal in several channels may be made. Dimensions: 540 x 573 x 497 mm. ☞
 ► Order Number BN 41601/. (please quote the number of the channel).

New

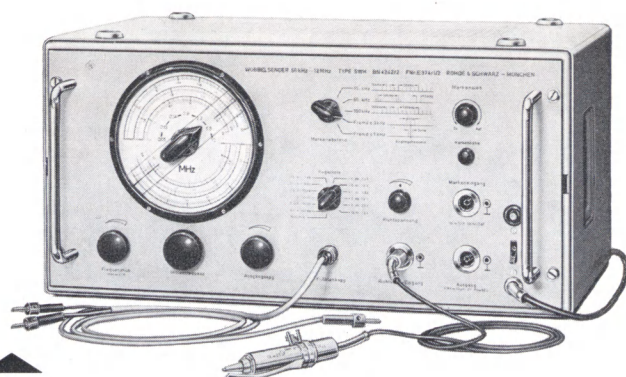


Test Pattern Generator Type SSF

Preferably used together with the Precision Blanking and Sync Signal Mixer MSF and the Precision Oscilloscope OMF, the Test Pattern Generator SSF checks and measures the transmission characteristics of TV transmission systems and TV transmitters. It generates the following video signals: square waves of 50 cps; square waves of horizontal frequency or multiples thereof, i.e., 15.625 kc, 100 kc and 250 kc; needle pulses, 3 per line; a staircase signal with 15.625 kc for grey-scale testing; sawteeth of horizontal frequency without interruption and followed by white or black lines. A test signal of 4 Mc generated in the instrument or one of 0.5 to 6 Mc applied from an external source may be superimposed on the sawtooth signals. Dimensions: 540 x 301 x 525 mm. ☞
 ► Order Number BN 4237.

Precision Blanking and Sync Signal Mixer Type MSF

This instrument combines the pulses delivered by a picture signal generator and the blanking and synchronizing pulses obtained from a standard or auxiliary pulse generator into a high-precision standard composite signal as required for checking television transmission systems. Since it is designed as a measuring instrument, the influence of the Precision Blanking and Sync Signal Mixer Type MSF on frequency response, linearity and signal shape is negligible compared to the distortions normally caused by the item under test. The Type MSF also permits superposition of radio-frequency voltages (0.5 to 6 Mc) for linearity measurements as well as of defined spurious voltages. In addition, a black-white level alternation of 0.5 cps can be produced by the signal mixer Type MSF so that the item under test alternately sees a black and a white level for one second. The Dimensions are 540 x 301 x 525 mm. ☞
 ► Order Number BN 4194.



Sweep Signal Generator ♦ 50 KC to 12 MC ♦ Type SWH

For studying 2- and 4-terminal networks with an oscilloscope. Centre frequency 50 kc to 12 Mc; sweep width ± 0.05 to 5%. Sweep frequency about 20 cps (linear sawtooth). EMF 50 μ v to 2 v. Source impedance 60 Ω . Frequency markers with 10, 50, 100 kc spacing; double frequency markers produced by an external frequency. Oscilloscope deflection voltage. For Y-deflection, amplified rectified output voltage of test item, and frequency and level markers; for X-deflection about 10 v_{pp}; linear sawtooth. R&S Standard Cabinet 57. ☞
 ► Order Number BN 4242/2.

Sweep Signal Generator ♦ 5 to 225 MC ♦ Type SWF

The Sweep Signal Generator Type SWF allows display of the response curve of 4-terminal networks in the frequency range 5 to 225 Mc up to a bandwidth of 24 Mc. Sweep width: ± 0.05 to ± 15 Mc, continuously adjustable. Sweep frequency equal to AC supply frequency. Output voltage across 60 Ω adjustable 0.1 to 100 mv. Marker spectrum: 1 and 10 Mc, applied via coupling unit. Diode probe. Sawtooth voltage for X-deflection. R&S Standard Cabinet 57. ☞
 ► Order Number BN 4243/2.



UHF Sweep Signal Generator ♦ 400 to 1200 MC ♦ Type SWU

The UHF Sweep Signal Generator Type SWU combines the characteristics of a sweep signal generator with those of a signal generator whose output voltage can be accurately adjusted. The centre frequency is continuously adjustable from 400 Mc to 1200 Mc without band switching. The range of the sweep width is 0 to ± 25 Mc at 400 Mc and 0 to ± 150 Mc at 1200 Mc; sweep frequency is equal to AC supply frequency. The output voltage across 50 Ω or 60 Ω is adjustable from 0.63 mV_{rms} to 2 V_{rms} by an 60-db attenuator in 10-db steps and an 10-db attenuator in 1-db steps. Constant output voltage; overall frequency response only $\pm 3\%$. Keyed off with AC supply frequency for sweep operation or 100% square-wave modulation. Output voltage for X-deflection of an oscilloscope. R&S Standard Cabinet 54. ☞
 ► Order Number Type SWU for 50 Ω – BN 4246/50; 60 Ω – BN 4246/60.

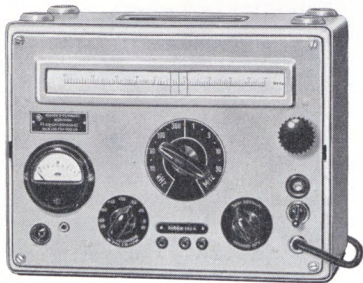
New

R&S FREQUENCY METERS

Resonance Frequency Meters

just like multimeters, belong to the standard instrumentation of radio-frequency laboratories. They include a tunable calibrated resonance circuit which by means of a resonance indicator is set to the unknown frequency. After tuning the frequency can be read from the scale. Thus, ease of operation and unambiguous test results are always ensured.

Frequency Meter $\uparrow 10 \text{ KC to } 30 \text{ MC} \downarrow$ Type WEN

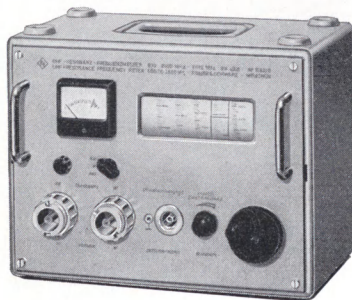


The Frequency Meter Type WEN combines simplicity and reliability with high sensitivity. The measurement range 10 kc to 30 Mc is covered in 7 bands with an accuracy of $\pm 0.5\%$. The sensitivity is adjustable between 5 mv and 20 v. An output is provided for the demodulated RF signal. R&S Standard Cabinet 35. ☛
 ► Order Number BN 435.

Resonance Frequency Meter $\uparrow 30 \text{ to } 500 \text{ MC} \downarrow$ Type WAM

Covers the frequency range 30 to 500 Mc in 8 sub-ranges. Accuracy $\pm 0.5\%$, sensitivity 200 mv at f.s.d. of resonance indicator. Output for demodulated radio frequency. Transistorized amplifier. Powered from 4 penlight cells. R&S Standard Cabinet 35. ☛
 ► Order Number BN 4312/2.

UHF Resonance Frequency Meter $\uparrow 470 \text{ to } 2500 \text{ MC} \downarrow$ WAL



Measurement range: 470 to 2500 Mc; accuracy: ± 0.08 to 0.15% depending on frequency; sensitivity: approx. 0.15 v at f.s.d. Bridging-type input. Output for demodulated UHF signal. Transistorized amplifier with 4 penlight cells. R&S Standard Cabinet 35. ☛
 ► Order Number for 50- Ω model – BN 4321/2/50; for 60- Ω model – BN 4321/2/60.

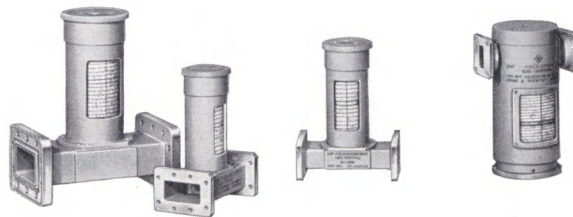
SHF Resonance Frequency Meter $\uparrow 1200 \text{ to } 4200 \text{ MC} \downarrow$ WAT

Frequency range of the Type WAT: 1200 to 4200 Mc in 2 bands; accuracy: $\pm 0.1\%$; sensitivity: approx. 0.1 v at full-scale deflection. Bridging-type input. Built-in transistorized amplifier. Four penlight cells serve as power supply. R&S Standard Cabinet 35. ☛
 ► Order Number for 50 Ω – BN 4322/50; for 60 Ω – BN 4322/60.

SHF Wide-Band Frequency Meter $\uparrow 1600 \text{ to } 12,400 \text{ MC} \downarrow$ WAB

The SHF Wide-Band Frequency Meter Type WAB is connected into the transmission line of a test assembly and absorbs a small portion of the energy when tuned to resonance. When tuned to $\lambda/4$, the Type WAB permits measurement of frequencies between 1600 and 5400 Mc, when tuned to $3/4\lambda$, it permits direct measurement between 5400 and 12,400 Mc. The transistorized amplifier is powered from four dry cells. R&S Standard Cabinet 35. ☛
 ► Order Number BN 4324.

SHF Frequency Meter $\uparrow 2700 \text{ to } 10,000 \text{ MC} \downarrow$ Type WFC



This frequency meter has two waveguide connectors and is used both as a high-precision frequency meter (accuracy 0.1%) and as a filter with a Q of 700 to 10,000, depending on the frequency range. It operates on the resonance method by using tunable cavities. During tuning, the pass-band attenuation goes through a minimum, so that a resonance deflection can be observed either on a suitable indicating instrument or by watching the power consumption of the load. The SHF Frequency Meter can either be directly inserted into the line or be connected via a directional coupler or a series Tee, depending on the circumstances. After tuning the frequency can conveniently be read from a helical scale without requiring any conversion. The scale length of 2500 mm ensures a high reading accuracy. The Type WFC has cross sections and flanges complying with the Standards of IEC and RMA. ☛
 ► Order Numbers: 2700 to 5200 Mc – BN 432811/229. 3800 to 7100 Mc – BN 432811/159. 5000 to 9000 Mc – BN 432811/137. 8200 to 10,000 Mc – BN 432811/90.

Frequency Indicators

provide for direct and continuous frequency indication on a panel-meter scale. This permits frequency variations to be observed conveniently. The measured value is largely independent of the amplitude and waveform of the input voltage. They are used as self-contained measuring instruments or in measuring systems to indicate the difference between the known and an unknown frequency.

Frequency Indicator $\uparrow 10 \text{ CPS to } 30 \text{ KC} \downarrow$ Type FTK



The Type FTK is a frequency meter with 6 sub-ranges. The indication is independent of the input voltage within 1 to 250 v. Accuracy: $\pm 2\%$ of f.s.d. Indication of fundamental frequency is ensured even with distorted AC voltage as long as dips on a half wave do not go below 0.5 v. Connection of a recorder and of photo-electric or contact-operated pickups for measuring the number of revolutions or strokes is possible. R&S Standard Cabinet 14. ☛
 ► Order Number BN 4700.

FKM

WAM

WAB

WFC

WID

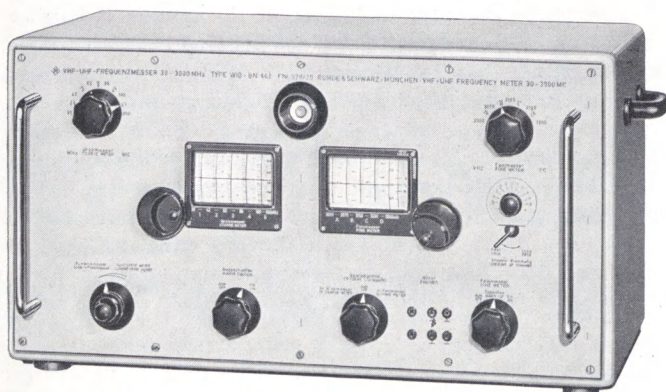
WAT

WAL

WIK

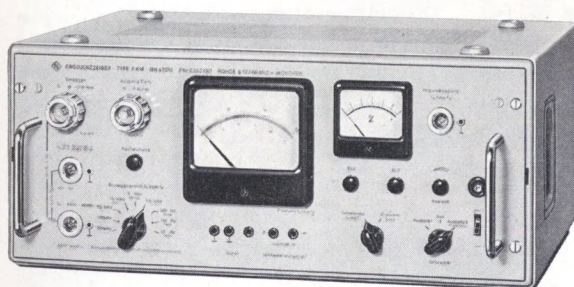
Heterodyne Frequency Meters

A heterodyne frequency meter is comprised of a highly stable reference oscillator, a mixer and an indicator for difference frequencies. An unknown frequency is measured by heterodyning it with a reference frequency or one of its harmonics which is then adjusted for a measurable or audible difference frequency. A heterodyne frequency meter can also be used as a precision-calibrated reference oscillator for investigations on highly selective passive networks, such as filters or receivers.



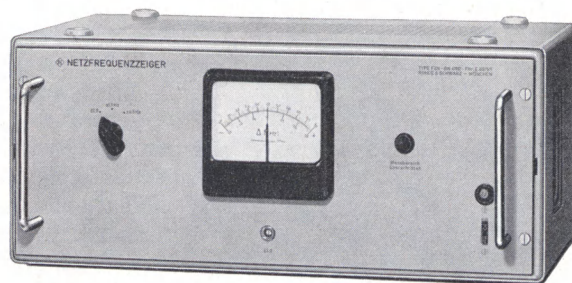
VHF-UHF Frequency Meter $\uparrow 30$ to 3000 MC \downarrow Type WID

The above instrument covers the frequency range 30 to 3000 Mc with an accuracy of 3 parts in 10^5 . Sensitivity: 2 mv. The fundamental measurement range is 30 to 300 Mc, above 300 Mc, frequency measurements are made against harmonics. Dimensions: 695x350x350 mm. $\text{R}\&\text{S}$ \blacktriangleright Order Number BN 442.



Frequency Indicator $\uparrow 10$ CPS to 500 KC \downarrow Type FKM

Direct indication from 10 cps to 500 kc in 9 ranges, with an accuracy of $\pm 1.5\%$ of f.s.d. Internal mixers permit measurement of the difference between an unknown frequency in the range 5 kc to 1000 Mc and a reference frequency which need not be higher than 30 Mc since its harmonics up to 1000 Mc are produced in the FKM. Beat-note indication allows adjustment of the two frequencies for zero beat. A "frequency magnifier" indicates $\pm 3\%$ of the measurement range at $\frac{3}{4}$ of f.s.d. A direct current of 0 to 10 ma proportional to the frequency is available for recording. $\text{R}\&\text{S}$ Standard Cabinet 561. $\text{R}\&\text{S}$ \blacktriangleright Order Number BN 47051.

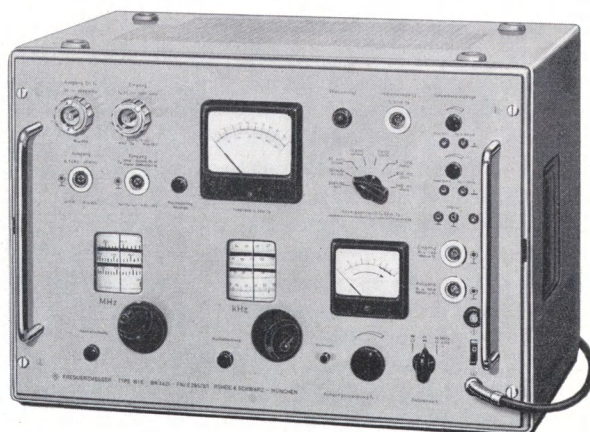


Mains Frequency Indicator $\uparrow 16\frac{2}{3}$, 50, 60 CPS \downarrow FZN

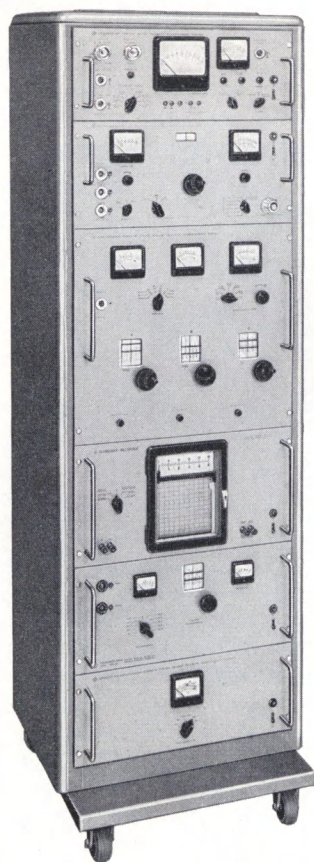
Permits measurement and recording of the AC supply frequency. Crystals provide the high accuracy of ± 2.5 millips at 50 cps or ± 3.0 millips at 60 cps. Zero check by built-in reference crystal. The wide measurement range and the output current which is load-independent in the range 0 to 10 k Ω make the set the ideal transducer for frequency control. Available for nominal frequencies of 50 cps and 60 cps. Use of the Frequency Converter $16\frac{2}{3} \rightarrow 50$ CPS makes the FZN also suitable for railway power systems with a frequency of $16\frac{2}{3}$ cps. $\text{R}\&\text{S}$ Standard Cabinet 56. $\text{R}\&\text{S}$ \blacktriangleright Ord. No. for 50 cps – BN 47092; for 60 cps – BN 47092/60. Frequency Converter $16\frac{2}{3}$ CPS \rightarrow 50 CPS – BN 470921.

Frequency Meter $\uparrow 10$ CPS to 1000 MC \downarrow Type WIK

The WIK is a compact instrument comprised of a crystal-controlled frequency standard driving a signal generator, of a mixer and a frequency indicator. In the frequency range of 10 cps to 1000 Mc the stability is 1 part in 10^7 /day with an additional frequency error of $\pm 2\%$ up to 30 kc, ± 50 cps up to 30 Mc and ± 1650 cps at 1000 Mc. The instrument produces a reference frequency, which is variable between 50 cps and 30 Mc and is mixed with the unknown frequency. The difference frequency is indicated. Above 30 Mc, harmonics of the reference frequency are used, the determination of the harmonic number being very simple. The voltage indicated on the meter is available for frequency recording. The Frequency Meter measures frequencies of remote AM and FM transmitters in conjunction with suitable receivers. $\text{R}\&\text{S}$ Standard Cabinet 5101. $\text{R}\&\text{S}$ \blacktriangleright Order Number BN 4421.



R&S FREQUENCY MEASURING SYSTEMS AND SYNTHESIZERS



Decade Frequency Measuring System XZA BN 444044, with Frequency Standard XSB, Recorder Type XMA and Times-Ten Frequency Multiplier XVD as accessory units.

Decade Frequency Measuring System Type XZA $\uparrow 10$ CPS to 1000 MC or 12,400 MC \downarrow

The Type XZA contains all the units necessary for precision frequency measurement. They are housed in a casted cabinet rack so that, in spite of its weight, the entire system can be easily moved from place to place. Measurements are based on the heterodyne method, i.e., an accurately-known reference frequency or its harmonics are heterodyned with the unknown frequency and adjusted for zero-beat with the aid of a difference frequency indicator. The reference frequency is obtained from the Frequency Synthesizer Type XUA (see below). Three dials permit varying its output frequency between 30 cps and 30 Mc. The first and second dials lock with crystal accuracy in steps of 100 kc and 1 kc, resp.; the third dial is continuously adjustable over a range of 1 kc (accuracy 0.5 cps). The built-in crystal oscillator has a daily stability of about 2 parts in 10^8 . The frequency accuracy can be further improved by an external 100-kc frequency of higher stability. Our Frequency Standard Type XSB (see below) with its stability of 2 parts in 10^9 suggests itself for this purpose. The built-in Frequency Indicator Type FKM (see page 23) mixes the frequencies to be compared and indicates the difference frequency from 10 cps to 500 kc. Thus, frequencies up to 1000 Mc can be measured. The reference frequency range can be extended up to 300 Mc by the Times-Ten Frequency Multiplier Type XVD (see page 7). When connecting the Mixer & Harmonic Generator Type XME to the Type XVD frequencies up to 12,400 Mc are measurable with the system. In operation as harmonic generator, the Type XME produces a harmonic spectrum of 300 to 12,400 Mc. The Recorder Type XMA, designed for operation with the Type XZA, records the measured frequencies as a function of time. Dimensions: 600 x 1638 (1808) x 640 mm. ⚡
► Order Numbers: XZA up to 1000 Mc – BN 444043; with space for extension up to 12,400 Mc – BN 444044. Mixer & Harmonic Generator XME – BN 444522. Recorder XMA – BN 444512.

Decade Synthesizer and Exciter Type XUD $\uparrow 100$ KC to 30 MC \downarrow

Like the Frequency Synthesizers XUA and XUB, the Decade Synthesizer and Exciter XUD operates on the principle of frequency synthesis. It derives a frequency, adjustable in 1-cps steps between 100 kc and 30 Mc, from one fixed, external standard frequency of 100 kc whose accuracy is practically fully maintained. Max. power output, adjustable, 1 w into 60 Ω . Test output 500 mv open circuit, 60 Ω source impedance. Dimensions: 600 x 780 x 730 mm. ⚡
► Order Number BN 444473.

Frequency Synthesizer Type XUA

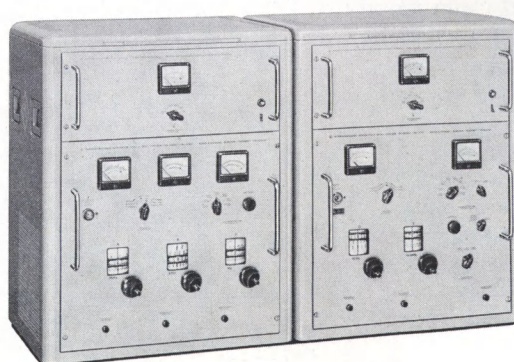
\diamond Frequency range 30 cps to 30 Mc \diamond

Permits any frequency from 30 cps to 30 Mc to be set on 3 dials. Crystal accuracy by lock-tuning on any 100 kc and 1 kc points. Continuous tuning between such points is possible to better than 0.5 cps. The output frequency is the sum of the 3 dial settings, each having a scale 1.2 m in length. A built-in crystal stage (stability about 2 parts in 10^8) is used as frequency standard. The XUA can also be driven by external 100-kc frequency of higher stability. The output voltage is sinusoidal, free from spurious frequencies and adjustable between 0.1 mv and 1 v (source impedance 60 Ω). The possibility of very accurate frequency adjustment makes the instrument ideal for stability measurements and calibration of active and passive instruments calibrated in terms of frequency. Precision frequency measurement is its most important application. The Type XUA forms part of the Frequency Measuring System Type XZA. Dimensions: 600x780x640 mm. ⚡
► Order Number BN 444463.

Frequency Synthesizer Type XUB

\diamond Frequency range 0.0005 cps to 10 kc \diamond

The ranges 0 to 100, 0 to 1000 and 0 to 10,000 cps are switch-selected. Crystal accuracy by lock-tuning on 1, 10 and 100 cps points. Continuous tuning between lock-tune points is possible to resp. better than 0.5, 5 and 50 millicycles. Output voltage sinusoidal, free from spurious frequencies and adjustable between 0.3 mv and 3 v (Z_{out} 600 Ω). Used, e.g., for calibrating direct-reading frequency meters, studying mechanical resonators, testing crystals and investigating plants. Connectable to Type XUA. Dimensions: 500 x 780 x 640 mm. ⚡
► Order Number BN 444465.



Frequency Synthesizer XUA Frequency Synthesizer XUB

Frequency Standard Type XSB $\uparrow 10^{-9}$

The Frequency Standard Type XSB delivers the frequencies of 1 Mc and 100 kc which are synchronized with each other. The output voltage is about 1 v EMF, the source impedance 60 Ω . Due to careful design of the crystal stage and the oven, frequency changes within 24 hours are less than 1 part in 10^9 if the temperature varies between $+15^\circ$ and $+35^\circ$ C, the AC supply voltage fluctuates by $\pm 5\%$ and the AC supply frequency remains between 47 and 63 cps. The stability increases with the time of uninterrupted service, as it does in all crystal-controlled precision oscillators. The mean daily frequency drift is less than 2 parts in 10^9 after 100 days of service and may decrease to a few parts in 10^{10} after a longer service time. A scale about 1 m in length has marks at frequency intervals of 1 part in 10^9 , settings in between being possible. The frequencies delivered have a very low spurious modulation (below -80 db). The Frequency Standard Type XSB is particularly suitable for driving the Decade Frequency Measuring System Type XZA and the Frequency Synthesizer Type XUA. R&S Standard Cabinet 57. ⚡
► Order Number BN 444112.

R&S STANDARD TIME SYSTEMS AND FREQUENCY STANDARDS

Standard Time Systems Type CAA

Standard time systems preserve and divide the fundamental unit of time, the mean duration of one rotation of the earth about its axis, into smaller units of time. Consequently, these systems are popular in observatories, time institutes, geographical and hydrographical institutes. Because of their accuracy, crystal clocks are excellent for this purpose. Delivering also standard frequencies, they can be used as primary frequency standards for calibration and control of frequency measuring equipment and for synchronous drive of clocks and astronomical instruments. The Standard Time Systems Type CAA combine different instruments which can also be set up outside the standard time system and used as self-contained units. All models of the Type CAA are accommodated in cabinet racks complying with DIN 41491. This type of construction provides for high mechanical stability, ease of access and operating convenience.

Standard Time System Type CAA BN 78011. Uses the Frequency Standard XSA as crystal stage. Frequency Divider XVB delivers 100-kc, 10-kc, 1-kc signals in sine-wave and pulse form. Harmonics of the pulse voltage suitable for calibration purposes up to about 120 Mc. Frequency Divider XVC delivers 100-cps, 50-cps, 10-cps and 1-cps signals, and a 1000-cps modulated seconds signal of 0.1 sec duration, and 0.5-cps square-wave pulses for a jumping-second-hand clock. At AC supply failure, the Mains Monitor XNY switches over to the Emergency Power Converter XNZ. Dimen.: 689x2012x612 mm. ⌚
► Order Number BN 78011.

Standard Time System Type CAA BN 78012. In addition to the units making up the system BN 78011, the system BN 78012 contains an All-Wave Receiver Type UE 12 and a Time Signal Oscillograph Type CAO for checking the system against radio time signals. The Time Signal Oscillograph has another 9 test inputs, to which any load desired may be joined, for comparison purposes. The Programme Contactor Type CAZ which is also included permits any combination of 6 independent 24-hour time signal programmes consisting of the actual time signals and the frequencies obtained from the Frequency Divider Type XVC. Dimensions: 689 x 2012 x 612 mm. ⌚
► Order Number BN 78012.

Standard Time System Type CAA BN 7804. The Type CAA BN 7804 comprises 3 systems of the basic model BN 78011 which are intercompared by means of the Phase Comparator XKC and the Recorder XKB. In addition, it contains the instruments of the system BN 78012 as well as a Rhythmic Signal Panel CAK and a Sidereal Time Converter CAS. The latter supplies sidereal-frequency signals for driving astronomical instruments and a sidereal-time clock with a jumping second-hand. The system is comprised of a three-section cabinet rack (1853 x 2012 x 612 mm) and a single-section rack (689 x 2012 x 612 mm) accommodating the 3 independent Frequency Standards Type XSA. ⌚
► Order Number BN 7804.

Astronomical Clock Systems Type CBA

As far as their outward appearance is concerned, the systems CBA are similar to the above systems. The essential difference is that they operate less accurately. ⌚
► Order No. for small system: BN 78013; medium-size: BN 78014; large-size: BN 78042.

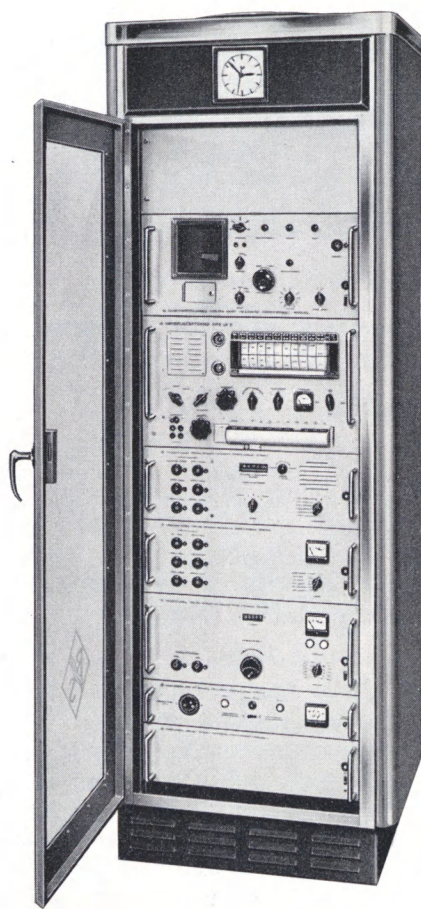


Frequency and Time Standard Type CAQ

A transistorized standard frequency generator with synchronous clock. It supplies the frequencies of 100 kc, 10 kc, 1 kc, 50 cps with a sinusoidal voltage of 2 v (EMF) at a source impedance

of 600 Ω ; in addition, 100 kc, 10 kc, 1 kc, 100 cps as positive pulses of 3 v_{pp} and a pulse duration < 3 μ sec at a source impedance of 60 Ω . The mean daily frequency drift after 3 days of operation is < 5 parts in 10⁸/day, after 30 days of operation < 2 parts in 10⁸/day. The effect of battery-voltage changes is below 10⁻⁸, that of usual temperature variations below 5 parts in 10⁸. The clock is of the jumping-second-hand type with a 12-hour dial, as well as hour, minute and second hands, and second and minute contacts. In case of power-supply failure the built-in floating battery ensures 12 hours of full operation or 100 hours of restricted operation. R&S Standard Cabinet 54. ⌚
► Order Number BN 7850.

New

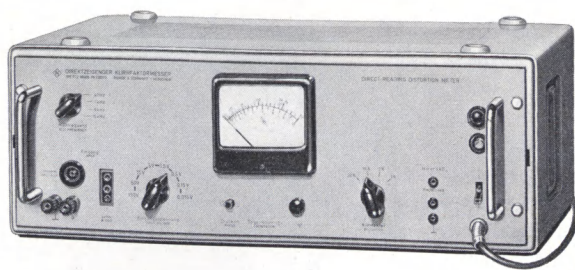


Standard Time System Type CAA BN 78012

Frequency Standard XSA $\pm 5 \times 10^{-10}$

Delivers the frequencies of 1 Mc and 100 kc with a level of 1 volt. A double-chamber oven and careful stabilization of all operating voltages ensure freedom from external influences so that the stability of the output frequencies is determined only by crystal aging which, after 10 days of service, is less than 5 parts in 10¹⁰/day, and progressively decreases with service time. Values below 1 part in 10¹⁰/day are obtainable. Incremental frequency tuning is possible by remote control, the total amount being read directly in terms of parts in 10¹⁰ on a mechanical register. This is of particular advantage when the instrument is used in standard time systems. Remote control is effected manually via a synchro-system. In addition, it can be made automatically by a frequency controller, which, in conjunction with auxiliary units, enables automatic frequency correction, e.g., against atomic or molecular frequency standards. Spurious modulation of the output voltages is down more than -80 db. Ambient temperature fluctuations are permissible between 0° to +40° C. R&S Standard Cabinet 56. ⌚
► Order Number BN 44111.

R&S WAVE ANALYZERS



Direct-Reading Distortion Meter $\uparrow 0.2$ to 30% \downarrow Type FTZ

The Type FTZ permits harmonic distortions to be measured at 40, 1000, 5000 and 15,000 cps and read directly from a meter. The measurement range 0.2 to 30% is covered in 4 sub-ranges. Accuracy $\pm 5\%$ of f.s.d. Permissible deviation of test frequencies from nominal values: $\pm 3\%$ at 40 cps and $\pm 5\%$ at the other frequencies. The impedance of the balanced input is greater than 10 k Ω , the permissible input voltage 50 mv to 4 v. The impedance of the unbalanced input is 1 M Ω shunted by 40 pf, the permissible input voltage 50 mv to 150 v. R&S Standard Cabinet 55. ⌚

► Order Number BN 4816.

AF Wave Analyzer $\uparrow 30$ CPS to 20 KC \downarrow Type FTA

The AF Wave Analyzer Type FTA separates a complex waveform in the frequency range of from 30 to 20,000 cps into its spectral components and then measures their amplitudes. The waveform to be investigated is heterodyned with a variable-oscillator frequency. The resulting intermediate-frequency signal passes to a crystal-type bandpass filter which has a bandwidth of 6 cps, steep slopes and high stop-band attenuation. If a rapid survey with reduced resolving power is desired or if the spectrum to be measured is somewhat instable in frequency, as is the case in noise analysis, an LC filter is used, which has a bandwidth of 200 cps and which likewise is characterized by steep slopes. The voltage indication on the large-size panel meter can be switch-selected to be linear or logarithmic. The measurement accuracy is $\pm 5\%$ or ± 1 db, respectively. The voltage range for the unbalanced input (input impedance 100 k Ω shunted by 40 pf) is 10 μ v to 100 v or -100 to +40 db, respectively. The voltage range for the balanced input (input impedance over 8 k Ω) is 10 μ v to 10 v or -100 to +20 db, respectively. Attention is drawn to the fact that the Type FTA can be made the heart of a test assembly as described on the next page. To this end, the instrument is provided with an output for a recorder, an output for connection of a synchronous oscillator and with the possibility of coupling a synchronous drive to the tuning knob. R&S Standard Cabinet 58. ⌚

► Order Number BN 48302.



Audio-Frequency Spectrograph $\uparrow 30$ CPS to 20 KC \downarrow FNA

The Audio-Frequency Spectrograph Type FNA is an extremely versatile high-quality instrument. It separates a complex waveform in the range 30 to 20,000 cps into its spectrum components and gives indication of their amplitudes not only on a panel meter but also in graphical form as a spectrogram. The waveform to be investigated is mixed in the instrument with a variable-oscillator frequency. The resulting IF signal passes through a narrow band-pass filter with steep slopes and high stop-band attenuation to the panel meter and the two-axis recorder. The selectivity is switch-selected. The bandwidth in narrow-band operation is 10 cps with the response down 3 db. The steepness of the slopes is manifested by the maximum value of ± 30 cps at the 80-db point. The bandwidth for wide-band operation is 200 cps. The high selectivity of the Type FNA is maintained equal throughout the entire frequency range, permitting, e.g., hum modulation sidebands also at 20 kc to be measured with the full resolving power. The frequency sweep can be operated either by hand or by the motor drive with constant speed. In narrow-band operation, the sweep time is 600 sec for 20 kc. For range spreading 1:5,



which can be selected at any point, it is 120 sec for 4 kc. In wide-band operation, the sweep time for 20 kc is reduced to 30 sec. The two-axis recorder writes on ordinary paper 210 x 148 mm in size, the long side placed horizontally, and is coupled in its horizontal motion with the frequency sweep. In the direction of the axis of ordinates, it records the amplitude linearly or logarithmically, as desired. The entire voltage range is 1 μ v to 100 v or -120 to +40 db for the unbalanced and 1 μ v to 10 v or -120 to +20 db for the balanced input. With linear indication the desired sub-range can be selected in 10-db steps and continuously between the steps. In the same way, the logarithmic range of indication, covering 80 db (1:10,000), can at will be shifted within the total range. The accuracy is 5% in linear, ± 1 db in logarithmic operation. The impedance of the unbalanced input is 100 k Ω shunted by max. 40 pf, of the balanced input above 8 k Ω . The oscillator frequency of the Type FNA can be taken off and fed to the synchronous oscillator. This gives a combination of instruments that is excellent for selective attenuation measurements. For more details see next page. Dimensions: 540 x 475 x 490 mm. ⌚

► Order Number of Audio-Frequency Spectrograph Type FNA: BN 48301. Chart (1000 eq): BN 483016.



Synchronous Drive for FTA

The Synchronous Drive consists of a synchronous motor with gear box which can easily be coupled to the tuning knob of the AF Wave Analyzer Type FTA. Thus it permits an automatic frequency sweep of $33\frac{1}{3}$ cps/sec as a linear function of time.



Exchangeable gear boxes for different sweep speeds. ¶

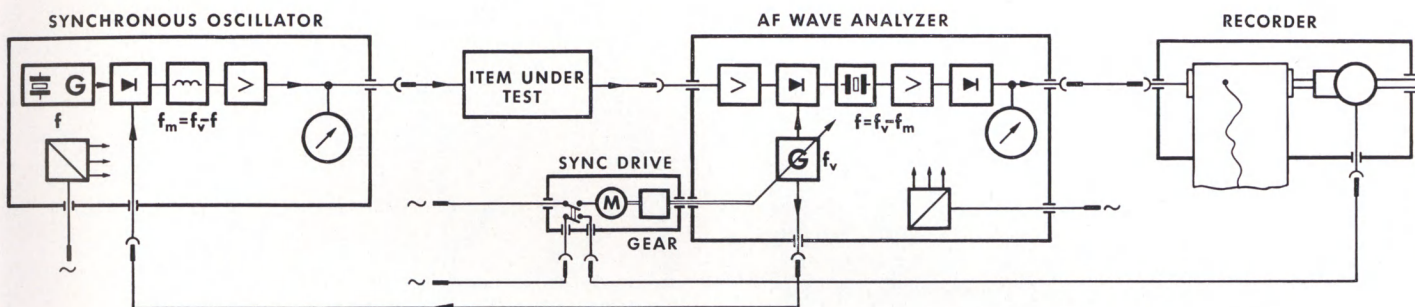
► Order Numbers: Synchronous Drive $33\frac{1}{3}$ cps/sec for 220 v/50 cps – BN 483024/50, do for 115 v/60 cps – BN 483024/60. Gear box 1 cps/sec – BN 483024/1, do 5 cps/sec – BN 483024/2, do 10 cps/sec – BN 483024/3, do 250 cps/sec – BN 483024/5.

Synchronous Oscillator $\uparrow 30$ CPS to 20 KC \downarrow for the AF Wave Analyzers Types FTA and FNA

The Synchronous Oscillator is an accessory unit for the AF Wave Analyzers Types FTA and FNA and, in conjunction with one of these instruments, enables frequency-response measurements on 4-terminal networks in the range 30 cps to 20 kc. Due to electrical control by the analyzer it automatically applies, to the input of the 4-terminal network under test, the frequency to which the

analyzer connected to the output of the 4-terminal network is tuned. This selective frequency-response measurement with an analyzer is extremely advantageous as compared to other methods. Output voltage adjustable from 1 μ v to 100 v max. Switch-selected source impedances, balanced and unbalanced. R&S Standard Cabinet 55. ¶

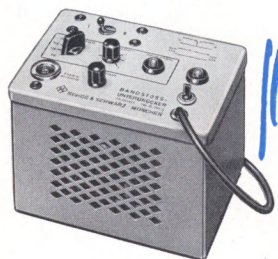
► Order Number BN 483011.



Mode of Operation of the Synchronous Oscillator and Set-up of a Frequency-response Recording System with Type FTA

The block diagram gives a survey of how an efficient attenuation test assembly with automatic recording can be set up using the Synchronous Oscillator, the AF Wave Analyzer Type FTA, the Synchronous Drive and the DC Recorder Type ZSG (see p. 30). It shows, without any further explanation being necessary, the principle of operation of the analyzer and how always the exact input frequency of the analyzer is produced by mixing the variable-oscillator frequency of

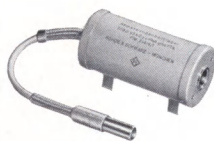
the analyzer with the stable oscillator frequency of the Synchronous Oscillator. The Synchronous Drive has only the mechanical duty to turn the tuning knob of the analyzer. Frequency sweep and recording are switched on together by means of a switch at the Synchronous Drive. In a similar way, a frequency-response recording system can be set up, using the Audio-Frequency Spectrograph Type FNA. In this case, of course, a synchronous drive and a special recorder are not required.



Tape-Splice Interference Suppressor

The Tape-Splice Interference Suppressor has the task to suppress the disturbing pulses with their broad frequency spectrum which occur at tape-splice points when frequency analysis is made by evaluating tapes with the AF Wave Analyzer and DC Recorder Type FTA. The time and the beginning of the suppression are adjustable. Dimensions: R&S Standard Cabinet 15. ¶

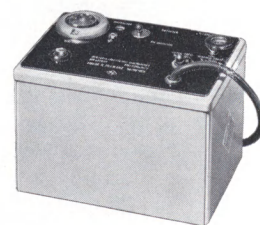
► Order Number BN 483025.



Matching Transformer for Dynamic Microphones

Used for matching dynamic microphones with 200 Ω impedance to the unbalanced input of the AF Wave Analyzers FTA and FNA. The voltage ratio is 1:15, the frequency response of the transformed voltage is $\pm 3\%$ referred to 1 kc. Good magnetic shielding. Dimensions: 65 dia. x 108 mm; 250-mm patch cord.

► Order Number BN 483022.



Microphone Power Supply for FTA & FNA

This instrument serves as preamplifier and/or power supply and makes possible the connection of the Capacitor Microphone BN 4502-40 and the Acceleration Pickup Type EBVB BN 452111 to the Wave Analyzers FTA and FNA. A cable up to 20 metres in length can be connected between the microphone and Microphone Power Supply without influencing the frequency response. ¶

► Order Number BN 483023.

R&S ACOUSTIC TEST SETS AND VIBRATION METERS

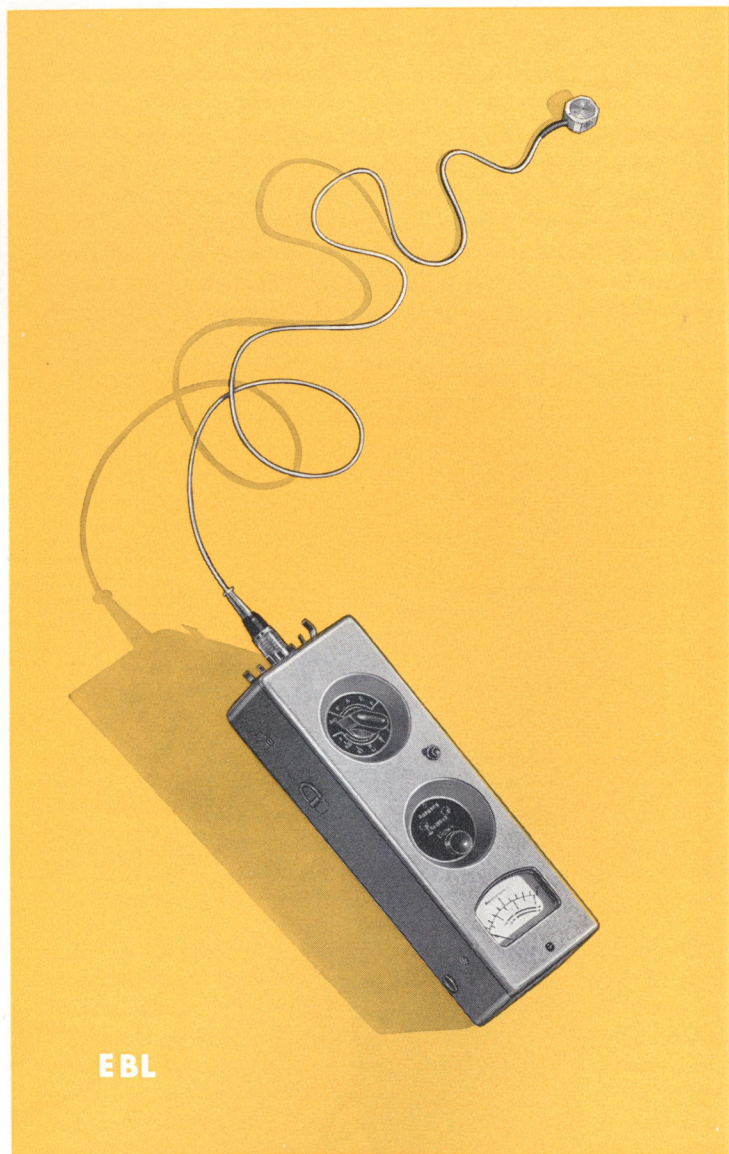


Vibrotest (Acceleration Meter) Type EBL $\uparrow 30$ to 12,000 CPS \downarrow

The acceleration meter Vibrotest Type EBL provides for measurement of vibrations from 30 to 12,000 cps, e.g., for studying the propagation of structure-borne sound or of the dynamic loading of vital components of aircraft and vehicles. Measurement range: 0.1 to 300 g (1 g = acceleration due to gravity = 9.81 m/sec^2). Velocity measurement from 0.5 cm/sec to 10 m/sec. Calibration against internal facility. Battery-powered. Dimensions: 300x85x85 mm. **► Order Number Type EBL complete – BN 4531. Adhesive wax to attach normal Acceleration Pickup – BN 45211-11; Acceleration Pickup (with permanent-magnet clamp) Type EBVB – BN 452112.**

Vibration Meter Type EBV $\uparrow 10$ to 12,000 CPS \downarrow

This instrument measures the vibrational acceleration, velocity and displacement of machines, turbines, vehicles, ships, aeroplanes and buildings, where the vibration is in the frequency range 10 to 12,000 cps. Noise control and the investigation of vibrations in machines and constructional parts with respect to direction and intensity are the principal applications of the Vibration Meter. It measures structure-borne sound and thus is capable of tracking its propagation or of locating its source. Direct reading of acceleration is ensured from 0.3 cm/sec^2 to 3000 m/sec^2 , of velocity from 0.03 m/sec to 10 m/sec and of displacement from 0.1μ to 1 m. These values are important for judging material stress. Every measurement range has 11 sub-ranges each covering 10 db. In all three ranges, the lowest range can only be used in conjunction with a highly selective filter. The velocity and displacement ranges usable in the individual case are dependent upon the frequency. The accuracy is $\pm 1 \text{ db}$ at 1000 cps. For the calibration of the Acceleration Pickup an electromechanical vibration calibrator has been incorporated in the instrument. The cross-axis sensitivity of the Acceleration Pickup is down more than 20 db; hence the spatial components of vibrations can be determined separately. Similarly to the Sound Level Meter Type EZGN, the Type EBV can be made the heart of a universal test assembly by use in conjunction with oscilloscopes, recorders such as Type ZSG, band filters such as Type PBO, heterodyne wave analyzers such as Type FNA or FTA, and tape recording instruments. These tape recorders also permit analysis of very low frequencies since recorded frequencies can be increased by increasing the speed of the tape. The instrument has sockets for aural monitoring with a loudspeaker or headphones without effect on the indication of the meter. An input for checking the amplifier or connecting the output of a tape recorder is provided. The Vibration Meter Type EBV is immune to magnetic interference. R&S Standard Cabinet 46. **► Order Number BN 4521/3.**



Acceleration Calibrator EBVT $\uparrow 50$ to 5000 CPS \downarrow

Provides for calibration of small acceleration pickups weighing from 4 to 30 grams. The acceleration is 5 metres per second per second = 0.51 g at 1000 cps (built-in oscillator) or at 50 to 5000 cps with a frequency fed from an external source. Dimensions: R&S Standard Cabinet 15. **► Order Number BN 45217.**



Sone Filter Type PBS

The Type PBS is an accessory unit to the Sound Level Meter Type EZGN and translates values measured in terms of German standard phons or db_A and db_B into sone values closely corresponding to subjective loudness perception. The sone filter divides the AF range into 6 channels. Pass-band attenuation: 3 db. Stop-band attenuation: more than 25 db. Characteristic impedance: 600 Ω . Frequency ranges of channels 1 to 6: 0–750 cps–1500 cps–2500 cps–3850 cps–6200 cps–infinite. R&S Standard Cabinet 15. **► Order Number BN 4930.**



New

Sound Level Meter Type EZLT $\uparrow 30$ to $12,500$ CPS \downarrow

The Type EZLT is a small instrument for the exact measurement of sound level. It covers both a very weak noise and most intense traffic noise. Frequency range: 30 to 12,500 cps. Sound-level range: 30 to 120 db re 0.0002 μ bar. Frequency weighting, switch selected: ISO curve A; ISO curve B; ISO curve C, flat. Accuracy: IEC standard specifications are met. Meter speed: fast or slow, switch-selected (IEC standard specifications are met). Calibration against internal facility. 2 audio outputs for special measuring purposes. The instrument is battery-powered. A battery charger is supplied. Length 305 mm.

► Order Number BN 4513.



EZLT

**Sound Level Meter Type EZGN $\uparrow 30$ to $12,500$ CPS \downarrow**

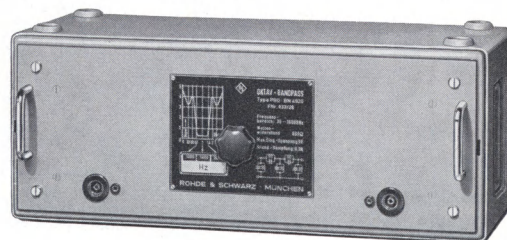
The Sound Level Meter Type EZGN offers direct-reading measurement of airborne-sound parameters, viz. sound pressure from less than 0.01 to 1000 μ bars, or from 20 to 134 db above threshold of hearing (2×10^{-4} μ bar), and the loudness level in German standard phons, i.e. weighted db closely corresponding to the ASA standards. Loudness can be measured from 1 to 320 sones in conjunction with the Sone Filter Type PBS. The frequency range is 30 to 12,500 cps. The accuracy of the phon measurement according to German standard DIN 5045 is ± 1 db at 1000 cps, ± 2 db at 60 cps, ± 4 db at 4000 cps. The accuracy for sound pressure measurements is ± 2 db between 50 and 5000 cps and ± 3 db above 5000 cps. The range of application may be extended by connection to a second microphone, to a vibration pickup – such as Acceleration Pickup Type EBVB with Adapter Type EBVA – to band-pass filters for coarse analysis of noise and to recorders or visual-display units. The frequency range from 30 to 12,500 cps and the measurement range from the minimum air-borne sound measurable up to the maximum sound pressure normally occurring in industrial plants or caused by aircraft or motor vehicles make the meter extremely versatile. Some interesting examples in the wide field of application of the Sound Level Meter Type EZGN are measurements of the acoustic power and efficiency of loudspeakers, of the sensitivity of microphones, of the sound distribution in rooms, of the sound insulation of constructional materials, etc. Moreover, the instrument is excellent for investigating noise sources (aircraft, machinery, gears) and measuring traffic noise. Analysing a noise with respect to its frequency components is possible by connecting a bandpass filter. Suitable filters are Octave Filter Type PBO BN 4920 or Sone Filter Type PBS BN 4930. R&S Standard Cabinet 46.

► Sound Level Meter Type EZGN – BN 4503. Second Microphone for Type EZGN – BN 4502-40. Acceleration Pickup Type EBVB – BN 452111, with permanent-magnet clamp – BN 452112. Adapter Type EBVA – BN 452121.

Octave Filter $\uparrow 31.5$ to $16,000$ CPS \downarrow Type PBO

Measurements in the audio range, e.g., on audio amplifiers, sound film equipment, transmission systems between studios and modulation stages, reverberation and vibration measurements often require an octave filter which permits separation of individual harmonics from the fundamental or passage of certain frequency bands of a large spectrum. Usable as selective network for the Sound Level Meter Type EZGN or Vibration Meter Type EBV, for coarse analysis of complex air- or structure-born sound. The pass band of 1 octave can be shifted from 31.5 to 16,000 cps in 17 one-half octave steps according to standards. Characteristic impedance 600 Ω . R&S Standard Cabinet 45.

► Order Number BN 4920.



R&S RECORDERS AND OSCILLOSCOPES

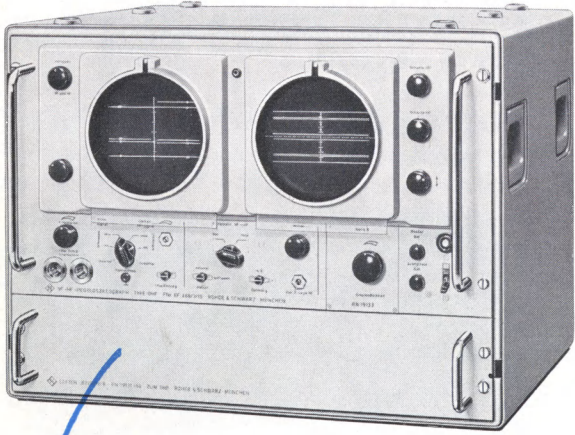


Precision Oscilloscope \uparrow DC to 20 MC \downarrow Type OMF

A versatile oscilloscope with special features for television engineering. Keyed DC restoration for maintaining blanking level; provision for line selection with output for picture monitor; Y magnifier for hum/noise and linearity measurements; internal sync by V or H pulses from composite signals, external sync by V or H pulses derived from combined or separate V and H sync signals. Directly connected X and Y amplifiers; Y-amplifier sensitivity 4 mv/cm max.; wide range of sweep frequency and repetition frequency: 0.1 cps to 750 kc; jitter-free display; accurate voltage measuring facility for absolute and relative measurements; versatile connection possibilities through paralleled and bridging-type inputs; built-in time marker generator. Dimensions: 540 x 370 x 455 mm. \pounds \blacktriangleright OMF-BN1912; Probe-BN19128; Camera Adapter-BN19120.

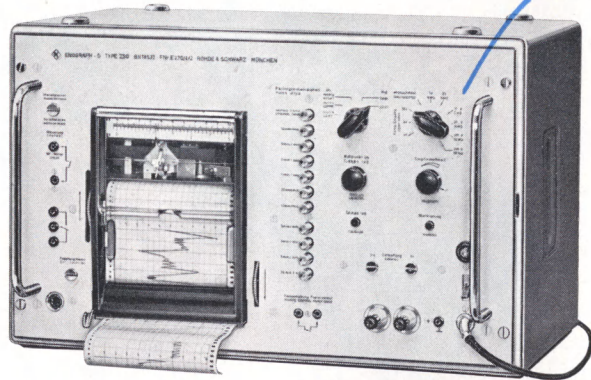
VF-RF Level Oscilloscope Type OHF

The VF-RF Level Oscilloscope facilitates and simplifies the monitoring of television transmitters. It displays the modulated VHF or UHF signal of a television transmitter directly on an oscilloscope, the signal being directly applied with about 10 v_{rms} to the deflection plates, without using any valves or non-linear elements. At the same time, the video input signal of the transmitter is displayed on the second CRT. In addition, the Type OHF includes a well-linearized double-sideband demodulator which can be used to investigate the RF signal in the usual manner for frequency response, linearity and extraneous voltages. Dimensions of the Type OHF: 540 x 370 x 455 mm. \pounds \blacktriangleright Order Number Type OHF for Band I - BN19131; for Band III - BN19133; for Band IV - BN19134. Camera Adapter BN19120; Transient Response Standardization BN19123.

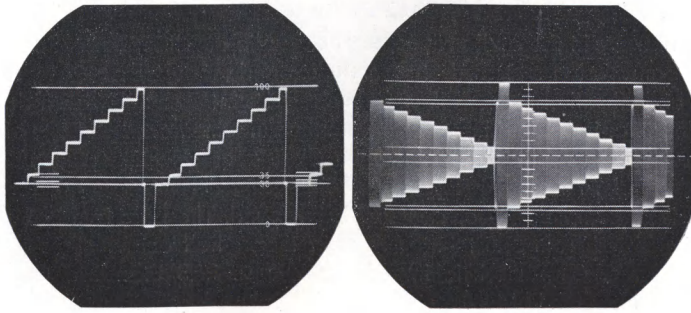


DC Recorder ENOGRAPH-G Type ZSG

The Enograph-G Type ZSG records DC voltages as well as all quantities that can be represented by a DC voltage. A switch permits linear or logarithmic response of the very sensitive indication to be selected. The high-impedance input is floating and enables direct connection of such diversified items as diode rectifiers, discriminators, electron multipliers, automatic control systems, etc. Measurement range: from 0 to 300 v DC linear and from 0.1 to 300 v DC logarithmic, in 5 sub-ranges and continuous in between. Input impedance: 5 to 50 M Ω ; 10¹¹ Ω selectable for the 1/3/10-v range. Pen speed: 250 msec for 0 to 99% of width of chart. The measurement quantity is traced on a strip of ordinary, metallized or wax paper, which is 120 mm in width. The four possible ways of recording, i.e., by ink pen, ball-point pen, electrode, stylus for wax paper, meet all requirements. 10 chart speeds from 20 mm/h to 10 mm/sec can be selected by a push-button. The chart can be driven by any external rotating device or, vice versa, the rotation of the chart-driving shaft can be transferred to an external device. Since the position of the zero can be shifted to the left, to the right or to the centre of the chart, difference voltages of either polarity can be recorded. The Enograph-G Type ZSG is a DC voltage recorder of very great electrical and mechanical stability. R&S Standard Cabinet 59. \pounds \blacktriangleright Order Number BN18532; for 60-cps supply - BN18532/60.



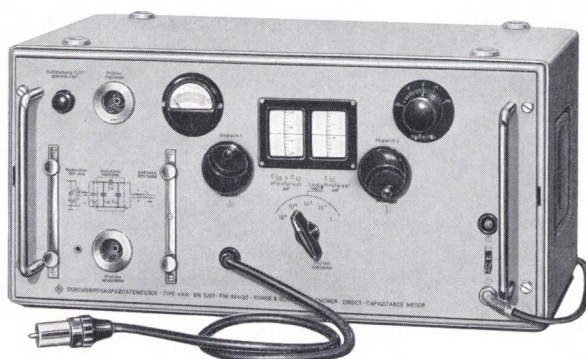
Two patterns taken with the VF-RF Level Oscilloscope Type OHF connected to a TV picture transmitter. The l.h. one shows a staircase video signal at the transmitter input. The r.h. one gives the corresponding output signal at 480 Mc.



R&S CAPACITANCE METERS AND STANDARD CAPACITORS

Direct-Capacitance Meter Type KKH $\downarrow 0.0003$ to $30 \text{ pF} \uparrow$

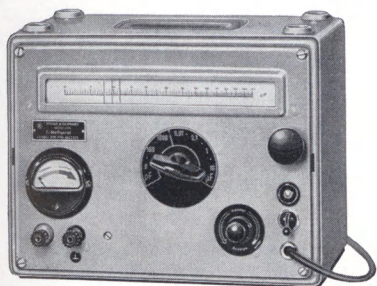
This instrument has been designed for measuring direct capacitances down to 0.0003 picofarad. Practical capacitance measurements usually have to deal with items having an earthed electrode 0 between the electrodes 1 and 2, providing a certain amount of shielding. The capacitance C_{12} , which is heavily reduced by the presence of the earthed electrode, is the direct capacitance. Apart from this direct capacitance C_{12} , the instrument also measures the capacitance to earth C_{20} and, after changing the connections, C_{10} . A few examples are measurements of the capacitance of capacitive couplers and switches and of the efficiency of the shielding of conductors and assemblies in instruments. Another important field of application is the measurement of all interelectrode capacitances existing in valves. In the range 0 to 60 pF , the earth capacitances C_{20} or C_{10} alone can be measured. Also obtainable is the dissipation factor of the direct capacitance at the measuring frequency. The Direct-Capacitance Meter Type KKH is so designed that sockets for a series of direct-capacitance measurements can be attached easily and directly to



the test socket. The capacitance of such devices can be cancelled by a single adjustment on the instrument. The test frequency is 500 kc . R&S Standard Cabinet 57. \pounds
► Order Number BN 5201.

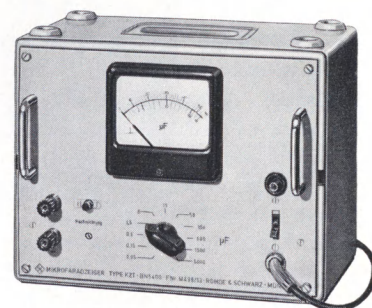
Capacitance Meter Type KARU \downarrow Capacitance Range 0 to $10 \mu\text{F} \uparrow$

Measures the capacitance of capacitors in the range 0 to $10 \mu\text{F}$ to an accuracy of $\pm 1\%$ $\pm 0.5 \text{ pF}$. When one of the 6 measurement ranges is selected, the front-panel window displays the associated scale, false measurements due to improper operation thus being prevented. The instrument operates on the resonance method. The wide measurement range (0 to $10 \mu\text{F}$) of the Capacitance Meter Type KARU is adequate for all conventional capacitance measurements encountered. A valve capacitance of a few picofarads is measured with the same reliability as the capacitance of a filter capacitor of several microfarads. The unknown capacitance is connected to an inductance of known value to form a parallel resonant circuit. The test frequency is 175 kc to 1.5 kc , dependent on the value of the capacitance. The dissipation factor of the capacitor does not affect the reading nor influence the measured value which can be read directly. Measuring the capacitance of long cables is possible because the test frequency is relatively low. R&S Standard Cabinet 35. \pounds
► Order Number BN 510.



Microfarad Meter Type KZT $\downarrow 0.01$ to $5000 \mu\text{F} \uparrow$

Economic production requires a capacitance meter which offers direct reading without adjustment to resonance or bridge balancing. With the Microfarad Meter Type KZT, the capacitance value can be directly read from a large panel meter. This instrument is excellent for production testing or rapid determination of large capacitances, and particularly for electrolytic capacitors. The measurement range is wider than usually required in practice and permits all kinds of capacitors to be measured, including the common paper capacitors of $10,000 \text{ pF}$ as well as electrolytic capacitors of extremely high capacitance. The Microfarad Meter Type KZT covers the range of 0.01 to 5000 microfarads in 11 steps. The accuracy of the instrument is $\pm 3\%$ of f.s.d., even for very large capacitors. The maximum test voltage for small capacitances is 7 v , the maximum loading of the capacitor under test is 1 mva . All measurements at supply frequency. R&S Standard Cabinet 35. \pounds
► Order Number BN 5400.



Limit Bridge Type KZS $\downarrow -25/12/6/2.5$ to 0 to $+2.5/6/12/25\% \uparrow$

The Limit Bridge Type KZS gives direct readings in percentage deviation from a suitable standard for unknown resistors in the range 10Ω to $1 \text{ M}\Omega$, capacitors in the range 10 pF to $1 \mu\text{F}$, and inductors in the range $100 \mu\text{H}$ to 2 mH , on a meter calibrated in per cent. The ranges of percentage deviation are $\pm 2.5\%$, $\pm 6\%$, $\pm 12\%$, $\pm 25\%$. Test frequency: 17 kc . Since the test result can simply be read without any necessity for tuning, high speed and ease of operation are ensured particularly in production testing. The procedure is the same also for inductance or resistance measurements. Sub-division into four measurement ranges permits measurement of all standardized tolerances of practical interest. A connector for a foot switch is provided. Further possibilities within the wide field of application are the adjustment of ganged variable capacitors and the determination of the temperature coefficient of capacitors and coils. Two adjustable pointers are provided to set the required tolerance limits. They facilitate the reading in production tests. R&S Standard Cabinet 35. \pounds
► Order Number BN 5500.

R&S measuring instruments can readily be placed upon one another to form test assemblies. Rack-mounting is easily possible after removing the instruments from their cabinets. For dimensions of the R&S Standard Cabinets see last page but one.

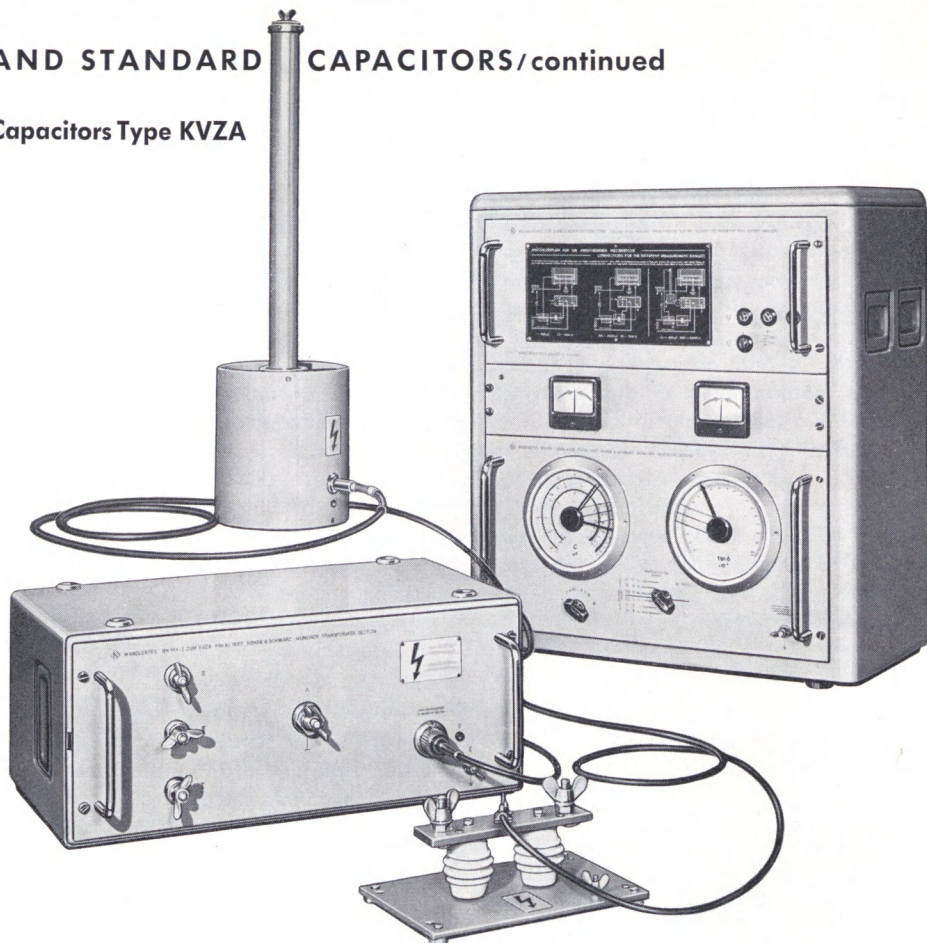


R&S CAPACITANCE METERS AND STANDARD CAPACITORS/continued

Automatic Test Bridge for Heavy-Current Capacitors Type KVZA

The Automatic Test Bridge Type KVZA is used for the production testing of heavy-current capacitors. It consists of a self-balancing bridge which gives a direct reading of the capacitance and the dissipation factor. The result is indicated on two large scales with adjustable limit markers, these scales thus permitting accurate readings or "go-not go" selection of capacitors. The capacitance range, in 15 overlapping sub-ranges, is 1 to 2000 μf for a test voltage of 50 to 1000 v and 0.1 to 200 μf for a test voltage of 0.5 to 10 kv. Accuracy: $\pm 1\%$. The measurement range of the dissipation factor is 0 to 200 parts in 10^4 . Dissipation-factor accuracy: $\pm 2.5\%$ of the measured value ± 2 parts in 10^4 . The measurement is made at the supply frequency of 50 cps. Because of the very wide voltage range and the short measurement time, the Type KVZA serves also to test capacitors at overvoltages while measuring capacitance and dissipation factor. The Automatic Test Bridge KVZA is comprised of: 1 R&S Standard Cabinet 56; 1 special cabinet 600x665x400 mm; and 1 high-voltage capacitor 180 dia. x 690 mm. ⚡

► Order Number BN 555.

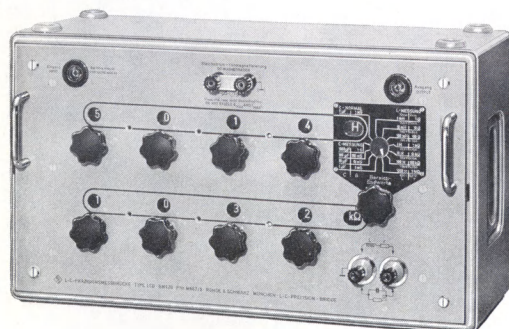
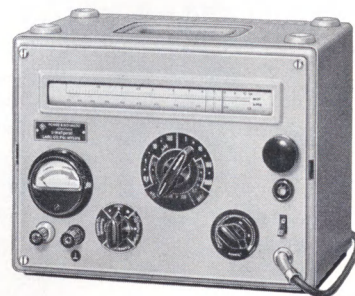


R&S INDUCTANCE METERS AND STANDARD INDUCTANCES

L-C Precision Bridge $\uparrow 10 \mu\text{H}$ to 1000 H / 0.01 to 1000 μF \uparrow Type LCB

Permits measurements, at frequencies between 50 cps and 20 kc, on lossy inductors and capacitors as well as resistors with an inductive component. For inductors, the measured values are those of the equivalent series circuit, the range covering 10 μh to 1000 h in series with 0.01 Ω to 1 M Ω . For capacitors, the measured values are those of the equivalent parallel circuit, the range covering 0.01 to 1000 μf in shunt with 10 μmhos to 1 mho. The result appears in two rows of figures, i.e., after balance of the bridge, the values of the inductance, capacitance or resistance can be read directly and separately, without requiring any attention to positioning of the decimal point, etc. The LCB combines high measurement accuracy with ease of operation. The bridge can be fed from the RC Generator Type SRM; a suitable null detector is our Tunable Indicating Amplifier Type UBM. The L-C Precision Bridge Type LCB may be used also as a variable precision capacitor of 100 pf to 1 μf and variable precision conductance of 0.1 to 1000 μmhos . R&S Standard Cabinet 46.

► Order Number BN 620.



Inductance Meter $\uparrow 0.1 \mu\text{H}$ to 1 H \uparrow Type LARU

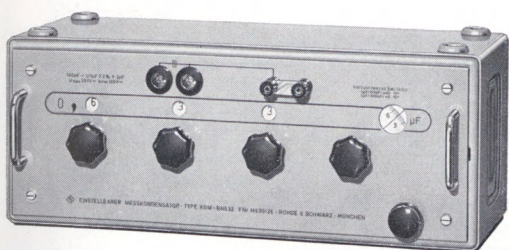
Operating on the resonance method, the instrument measures the inductance of coils in the range 0.1 μh to 1 h with an accuracy of $\pm 1\% \pm 0.01 \mu\text{h}$. Besides, it serves for determining the natural resonance of coils and parallel-resonant circuits. Both measurements reveal the self-capacitance of the coil under test. The measurement frequency is 4.5 Mc to 2.2 kc. Errors due to false manipulation practically impossible. The linear scale on the cylinder type dial, tested in many R&S instruments, ensures ease of operation and reading accuracy. When one of the 7 bands is switch-selected, a front panel window automatically displays the associated inductance or resonance-frequency scale, confusion of scales thus being avoided. R&S Standard Cabinet 35. ⚡

► Order Number BN 610.

Variable Test Capacitor Type KGM**♦100 pF to 1.11 µF♦**

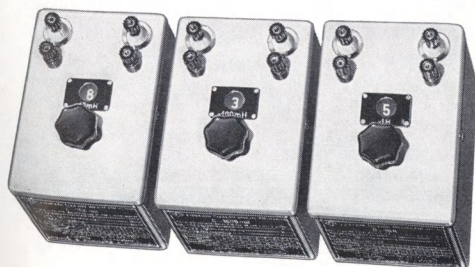
Due to its high accuracy, the Variable Test Capacitor Type KGM is used for a great number of electrical measurements. It features a dissipation factor as small as 5 parts in 10^4 and covers the capacitance range of 100 pF to 1.11 µF in 4 decade steps (100 to 1100 pF continuously, 10×0.001 µF, 10×0.01 µF, 10×0.1 µF). Owing to its high resonant frequency, which depending upon the capacitance value adjusted for is about 0.35 to 11 Mc, the Type KGM can be used over a wide frequency range. The accuracy is $0.2\% \pm 3$ pF, the admissible operating voltage 250 V DC or 200 V AC. The Variable Test Capacitor Type KGM shown below has a double shielding, the inner shield being connected to a capacitor terminal. R&S Standard Cabinet 46.

► Order Number BN 532.

**Decade Inductors Type LDH and Type LDN**
♦10 µH to 10 H♦

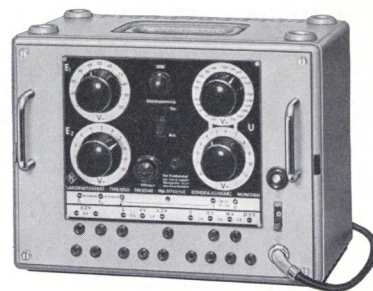
The Decade Inductors Types LDH and LDN are useful instruments for calibration or experimental work and permit rapid arrangement of a temporary setup. They are used, e.g., for the arrangement of radio-frequency resonant circuits or very-low and audio-frequency circuits, such as filters, smoothing networks, etc. The various decade inductors are frequently used for experimental physics and demonstrations at schools and technical colleges.

► Order Number Type LDH 10×10 µH BN 6321
 Order Number Type LDH 11×100 µH BN 6322
 Order Number Type LDN 10×1 mH BN 6310
 Order Number Type LDN 10×10 mH BN 6311
 Order Number Type LDN 10×100 mH BN 6312
 Order Number Type LDN 10×1 h BN 6313

**Laboratory Power Supply NGU**

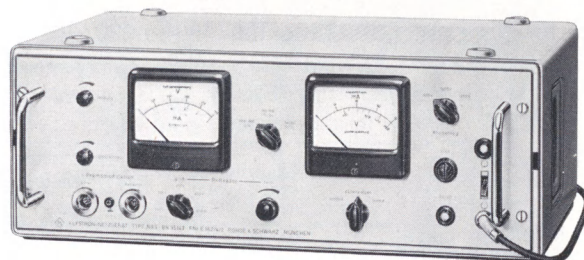
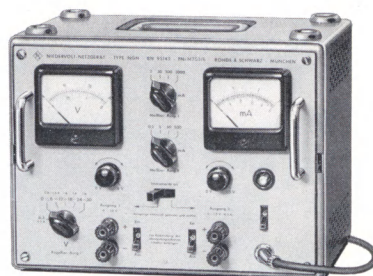
The Type NGU supplies 3 electronically stabilized DC voltages, which can be adjusted on a calibrated scale. (1) 100 to 300 V, 100 mA, source impedance about 1Ω , hum below 0.2 mV. (2) 0 to -100 V, source impedance below $25 \text{ k}\Omega$ shunted by $16 \mu\text{F}$, hum below $30 \mu\text{V}$. (3) 0 to -10 V, source impedance below $10 \text{ k}\Omega$ shunted by $50 \mu\text{F}$, hum below $10 \mu\text{V}$. DC voltages floating; common zero. In addition, across 3 windings the following unstabilized AC voltages: (1) 6.3 V; 2 amps (2) 4 V/6.3 V; 2 amps (3) 15 V/18 V/21.5 V; 1 amp. R&S Standard Cabinet 35.

► Order Number BN 95140.

**Low-Voltage Power Supply Type NGN****♦0 to 1.5 V DC, 0 to 30 V DC♦**

The Type NGN is a high-stability DC voltage source which requires no maintenance and is suited to take the place of batteries and accumulators. The set is especially suitable for transistors and delivers two mutually independent, floating and continuously adjustable DC voltages: 0 to 30 V, max. 1 (2.5) amp; 0 to 1.5 V, max. 0.5 amp. Short-circuit proof. The Type NGN may also be used for charging storage batteries with a constant charging voltage. R&S Standard Cabinet 35.

► Order Number BN 95143.

**Klystron Power Supply Type NGS**

The Klystron Power Supply Type NGS serves to feed the various SHF Signal Generators Type SMCK; it is, however, also used as a self-contained unit. Beam supply, 3 steps: 500 V/14 mA; 1000 V/1250 V/25 mA. The positive pole is earthed. Reflector supply, 7 steps: 15–100–200–300–400–500–600 V, continuously variable between steps. Grid modulation by 1000-cps square-wave voltage. R&S Standard Cabinet 55.

► Order Number BN 95147.

High-Voltage Tester Type UHP**♦50 to 2000 V DC♦**

Steps: 50/250/350/500/700/1000/1500/2000 V; max. possible short-circuit current: 0.4 mA. A practical instrument permitting the safe checking of dielectric strength. Resistance readings from $10 \text{ k}\Omega$ to $1200 \text{ M}\Omega$. R&S Std. Cabinet 35.

► Order Number BN 1950.



R&S TRANSFORMERS AND MATCHING PADS

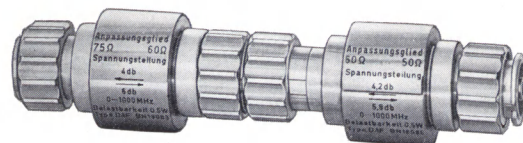
Balanced General-Purpose Transformer TAN \uparrow 30 to 20,000 CPS \downarrow



Transformer with flat frequency response. Matching values, max. current and voltage ratings are indicated on the housing. Power handling capacity: 40 w at 50 cps. R&S Standard Cabinet 15.

► Order Numbers: BN 96900 – with centre tap 200/300/600/800/1600 Ω ; without centre tap 2.6 to 1166 Ω in 25 steps. BN 96901 – with centre tap 0.6/2.5/5/10/20 k Ω ; without centre tap 0.15 to 14.5 k Ω in 25 steps.

Matching Pads Type DAF \uparrow 0 to 1000 MC \downarrow

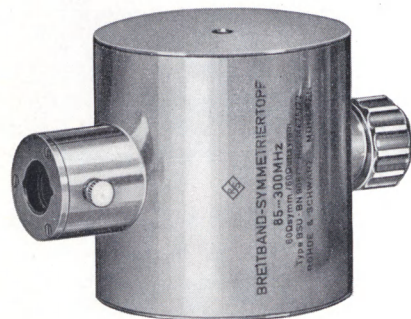


Suited for connecting measuring instruments to receivers or transmission lines of different characteristic impedance. Frequency range: 0 to 1000 Mc. Power handling capacity: 0.5 w. VSWR: 1.15 max. up to 1000 Mc. Dimensions: 105 mm x 50 mm dia.

► 60 Ω : 75 Ω – Order Number BN 18083; 50 Ω : 75 Ω – BN 18084; 50 Ω : 60 Ω – BN 18085.

Broadband Baluns Type BSU \uparrow 10 to 90/30 to 180/85 to 300 MC \downarrow

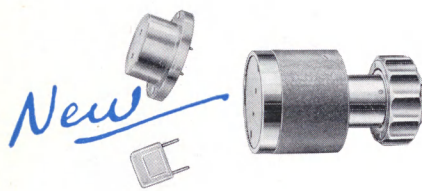
These units serve as low-reflection transitions between unbalanced and balanced items, e.g., between balanced aerials and unbalanced receiver inputs. They are usable in both directions and, therefore, enable exact impedance measurements.



Characteristic Impedance Ω Unbal./Bal.	Frequency Range Mc	Power Rating w	Connectors Unbalanced/Balanced	Order Number
50/50	10-90	300	Dezifix B / 2 terminals	BN 90610/50
60/60	10-90	300	Dezifix B / 2 terminals	BN 90610/60
60/60	10-90	300	Dezifix B / shielded twin socket	BN 90610/D
50/50	30-180	300-120	Dezifix B / 2 terminals	BN 90611/50
60/60	30-180	300-120	Dezifix B / 2 terminals	BN 90611/60
60/60	30-180	300-120	Dezifix B / shielded twin socket	BN 90611/D
50/50	85-300	200-100	Dezifix B / 2 terminals	BN 90612/50
60/60	85-300	200-100	Dezifix B / 2 terminals	BN 90612/60
60/60	85-300	200-100	Dezifix B / shielded twin socket	BN 90612/D

Impedance Transformer Type BSI \uparrow 10 to 100/100 to 420/300 to 1000 MC \downarrow

The impedance transformers serve for matching measuring instruments with an unbalanced connector and a conventional impedance of 50, 60 or 75 Ω to balanced test items of 200 to 300 Ω . Because of their small attenuation, they are also suitable for matching balanced loads of 200, 240 or 300 Ω to unbalanced signal sources such as signal generators of 50, 60 or 75 Ω source impedance.



The unbalanced connector is Dezifix B, the balanced connector has 2 sockets for 1.3-mm dia. pins, spacing 12.6 mm. 1 plug for twin lead and 1 adapter with sockets for 3-mm dia. pins, spacing 12 mm, are supplied with the Transformer BSI.

Characteristic Impedance Ω Unbal./Bal.	Frequency Range Mc	Power Rating w	VSWR with Bal. Termination	Balance Error	Order Number
50/200	10-100	5	< 1.05	< 3 %	BN 90634/200
60/240	10-100	5	< 1.05	< 3 %	BN 90634/240
75/300	10-100	5	< 1.05	< 3 %	BN 90634/300
50/200	100-420	5	< 1.07	< 5 %	BN 90635/200
60/240	100-420	5	< 1.07	< 5 %	BN 90635/240
75/300	100-420	5	< 1.07	< 5 %	BN 90635/300
50/200	300-1000	5	< 1.10	< 5 %	BN 90636/200
60/240	300-1000	5	< 1.10	< 5 %	BN 90636/240
75/300	300-1000	5	< 1.10	< 5 %	BN 90636/300

Selective Impedance Transformer \uparrow 50 Ω : 5 Ω , 300 to 2400 MC \downarrow Type TSI

The selective impedance transformer mainly serves for matching semiconductor impedances with resistive components below 10 Ω in the frequency range from 300 to 2400 Mc to impedance meters with a conventional impedance of 50 Ω . Tuning is made by adjusting the sliding section. The scale is provided with a vernier; the permissible setting error is 1% max. of length or frequency. VSWR: less than 1.1. Attenuation: less than 1 db. Dimensions of the transformer: 75 x 80 x 700 mm; max. length: 865 mm.



► TSI Order Number BN 90625/50.

R&S COMPONENTS AND SUNDRIES

Connectors for Coaxial Cables and Accessories



FS 413/11



FS 432



FS 501

Order Number	Designation	Suitable Types of Cables		Connection of the		Characteristic Impedance Ω	Power-handling Capacity at 100 Mc kw ⁴	Insulation
		Max. centre conductor dia./min. inside dia. of outer conductor (measured in mm) or type of cable	Type of outer conductor	centre	outer conductor by			
FS 413/11 FS 413/12	13-mm plugs (DIN 47284)	1.5/6.6 1.0/4.3	Braid Braid	Soldering Soldering	Soldering Soldering	60 60	0.8 0.8	Ceramic Ceramic
FS 432 FS 435 FS 435/50 FS 4350 FS 4350/50 FS 4351 FS 4354	Short-stroke connectors ¹ Dezifix B ² (DIN 47285)	1.5/6.6	Braid	Soldering	Soldering	60	0.25	Plexiglass
		2.3/10	Braid	Soldering	Soldering	60	1	Ceramic
		RG-8/U	Braid	Soldering	Soldering	50	1	Ceramic
		2.3/10	Braid	Soldering	Clamping	60	1	Ceramic
		RG-8/U	Braid	Soldering	Clamping	50	1	Ceramic
		2.3/10	Solid	Soldering	Clamping	60	1	Ceramic
		2.2/9.5	Double braid	Soldering	Clamping	60	1	Ceramic
FSW 4350 FSW 4351 FSW 4352 FSW 4354 FSW 4357	Short-stroke connectors Angle Dezifix B (DIN 47285)	2.3/10	Braid	Soldering	Clamping	60	1	Ceramic
		3.2/10	Solid	Soldering	Clamping	60	1	Ceramic
		1.5/6.6	Braid	Soldering	Clamping	60	1	Ceramic
		2.2/9.5	Double braid	Soldering	Clamping	60	1	Ceramic
		2.3/10	Double braid	Soldering	Clamping	60	1	Ceramic
FS 501 FS 501/50 FS 501/75 FS 502	Short-stroke connectors Precision Dezifix B ³ (DIN 47285)	2.3/10	Braid	Soldering	Clamping	60	0.25	Polystyrene
		Succo PTT7x0.728	Braid	Soldering	Clamping	50	0.25	Polystyrene
		RG-11/U	Braid	Soldering	Clamping	75	0.25	Polystyrene
		2.2/9.5	Double braid	Soldering	Clamping	60	0.25	Polystyrene
FZ 434	Short-circuit Dezifix B	Serves to short-circuit lines terminated in a short-stroke connector Dezifix B.						
FZ 432	Wrench for Dezifix B	Serves to screw on the spring cap when assembling the short-stroke connector Dezifix B.						

¹ The designation "short-stroke" connector indicates that only a very short axial movement is necessary for connecting cables fitted with Dezifix connectors. This is of particular advantage for connecting cables with solid outer conductors or cables for handling high power since these cables are relatively rigid. A further advantage of the Dezifix system is that the connectors are identical, there being no male and female (sexless system).

² Only such Size B Dezifix connectors are tabulated, which are used on the measuring instruments. For larger Dezifix connectors used for higher power, please write for a separate list.

³ These Precision Dezifix connectors feature negligible VSWR even in the frequency range of from 600 to 3000 Mc.

⁴ The specified power-handling capacity refers to the connector only, irrespective of the cable used.

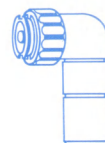
Branching Connectors with Dezifix B

Order Number	Designation	Characteristic Impedance Ω	Power-handling capacity at 100 Mc kw	Insulation
HT 497 FS 531 HT 66	Branching connector with 5 short-stroke connectors Dezifix B Branching connector with 3 short-stroke connectors Prec. Dezifix B VHF Probe Type Insertion Unit	60	1	Ceramic Polystyrene Ceramic

Adapters from Dezifix B to Other Types of Connectors

Order Number	Designation	Characteristic Impedance Ω		Insulation
FSU 511/50	Adapter Precision Dezifix B to N Plug (MIL)	50		Polystyrene
FSU 512/50	Adapter Precision Dezifix B to N Socket (MIL)	50		Polystyrene
FSU 513/50	Adapter Precision Dezifix B to C Plug (MIL)	50		Polystyrene
FSU 514/50	Adapter Precision Dezifix B to C Socket (MIL)	50		Polystyrene
FSU 515/50	Adapter Precision Dezifix B to BNC Plug (MIL)	50		Polystyrene
FSU 516/50	Adapter Precision Dezifix B to BNC Socket (MIL)	50		Polystyrene
FSU 521	Adapter Precision Dezifix B to RF Plug 6/16 DIN 47282	60		Polystyrene
FSU 522	Adapter Precision Dezifix B to RF Socket 6/16 DIN 47282	60		Polystyrene
FSU 531/50	Adapter Precision Dezifix B to UHF Plug (Small Single) (MIL)	50		Polystyrene
FSU 532/50	Adapter Precision Dezifix B to UHF Plug (Small Single) (MIL)	50		Polystyrene
FSU 541/50	Adapter Precision Dezifix B to General Radio Connector 874	50		Polystyrene
FSU 551/50	Adapter Precision Dezifix B to Marconi Connector H 4	50		Polystyrene

Adapters from short-stroke connectors Dezifix B to connectors used for higher power are also available. Please write for a separate list.



FSW 4350



FZ 434



FZ 432



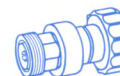
FSU 511/50



FSU 512/50



FSU 521



FSU 522



FSU 531/50



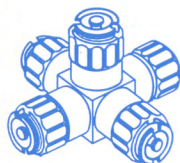
FSU 532/50



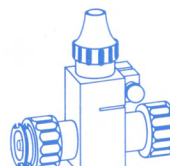
FSU 541/50



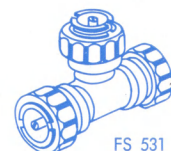
FSU 551/50



HT 497

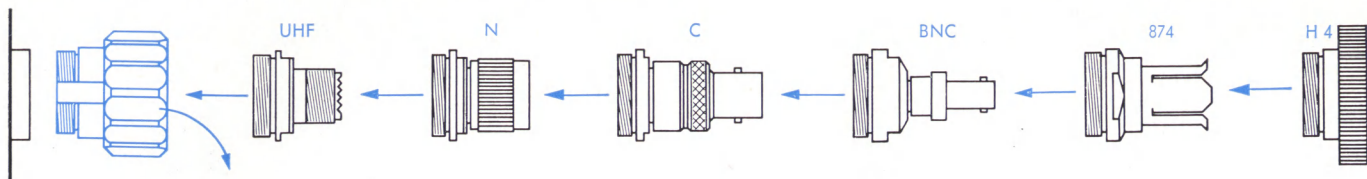


HT 66



FS 531

R&S COMPONENTS AND SUNDRIES/continued



Adapting R&S Instruments to Other Types of Connectors

The R&S measuring instruments are provided with two types of connectors which allow connection to coaxial lines: with the 13-mm socket (DIN 47284) – mating connector on the cable: 13-mm plug (DIN 47284) – for frequencies up to about 30 Mc; with the short-stroke connector Dezifix B (DIN 47285), a sexless type of connector, for frequencies above 30 Mc. Transition to other connector systems is possible with the adapters listed on page 35. For technical reasons, however, it is better to use the Screw-in Connectors listed on this page. For 13-mm sockets, they are simply screwed into the socket. In the case of Dezifix connectors, the Dezifix parts outside the instrument are unscrewed and the Screw-in Connector is screwed in. Modifications within the instrument are not required. A prerequisite for this simple and satisfactory transition to other connector systems is that the instruments are provided with adaptable connectors. ROHDE & SCHWARZ has planned to provide the new instruments, which will be supplied in the future, with such connectors.

Screw-in Connectors for R&S 13-mm Sockets (DIN 47284)

Screw-in Connectors from 13-mm Socket to... (= Part to be screwed into the socket)	► Order Number
Dezifix B (DIN 47285)	FZD 41311
RF Socket 4/13 DIN 47283 ¹	FZD 41313
UHF Socket (Small Single) (MIL)	FZD 41315
N Socket (MIL)	FZD 41317
C Socket (MIL)	FZD 41319
BNC Socket (MIL)	FZD 41321

Screw-in Connectors for Dezifix B Connectors on R&S Instruments

Screw-in Connectors from Dezifix B to ... (= Part to be attached to the instrument to replace the front part of the Dezifix)	► Order Number (Mates with the standard model)	► Order Number (Mates with the tube-type model) ⁴
UHF Socket (Small Single) (MIL) 50 Ω	FHD 10910/50	FHD 10900/50
UHF Plug (Small Single) (MIL) 50 Ω	FHS 10910/50	FHS 10900/50
N Socket (MIL) 50 Ω	FHD 20910/50	FHD 20900/50
N Plug (MIL) 50 Ω	FHS 20910/50	FHS 20900/50
C Socket (MIL) 50 Ω	FHD 30910/50	FHD 30900/50
C Plug (MIL) 50 Ω	FHS 30910/50	FHS 30900/50
BNC Socket (MIL) 50 Ω	FHD 40910/50	FHD 40900/50
BNC Plug (MIL) 50 Ω	FHS 40910/50	FHS 40900/50
RF Socket 4.1/9.5 ² 50 Ω	FID 20910/50	FID 20900/50
RF Plug 4.1/9.5 ³ 50 Ω	FIS 20910/50	FIS 20900/50
RF Socket 7/16 ² 50 Ω	FID 40910/50	FID 40900/50
RF Plug 7/16 ³ 50 Ω	FIS 40910/50	FIS 40900/50
RF Socket 3.5/9.5 DIN 47281 ² 60 Ω	FID 20910/60	FID 20900/60
RF Plug 3.5/9.5 DIN 47281 ³ 60 Ω	FIS 20910/60	FIS 20900/60
RF Socket 6/16 DIN 47282 ² 60 Ω	FID 40910/60	FID 40900/60
RF Plug 6/16 DIN 47282 ³ 60 Ω	FIS 40910/60	FIS 40900/60
General Radio Connector 874 50 Ω	FLA 20910/50	FLA 20900/50
Marconi Connector H 4 50 Ω	FLB 20910/50	FLB 20900/50

Note! For the adaptation of the Dezifix B connectors we recommend the use of our open-end/bi-nose box-end wrench, the Dezifix-adapting wrench. ► Order Number FZM 10900.

¹ Siemens receptacle. ² Siemens-Spinner receptacle.

³ Siemens-Spinner plug.

⁴ This type of Dezifix is used for measuring instruments where the coaxial section of the Dezifix connector must retain its cross section where it extends into the instrument, such as a directional coupler.

Calibrated Adjustable Shorts for Coaxial and Waveguide Equipment

Calibrated Adjustable Short (13 cm). Coaxial 130 mm extensible. Vernier setting ± 0.05 mm, with gauge blocks ± 0.005 mm. Dezifix B. ► Ord. No.: with 6 gauge blocks and 5 contact rings in a case, 50 Ω – BN 39591/50, 60 Ω – BN 39591/60, 75 Ω – BN 39591/75.

Calibrated Adjustable Short (50 cm). Same as above, but 500 mm extensible length. Setting with vernier, ± 0.05 mm. Possibility to insert gauge blocks. Dezifix B. ► Order Number: 50 Ω – BN 39592/50, 60 Ω – BN 39592/60, 75 Ω – BN 39592/75.

Inner conductors and plungers for changing the impedances. ► Ord. Nos.: Plunger 50 Ω – BN 39591-4/50, 60 Ω – /60, 75 Ω – /75. Inner Conductor (for BN 39591/.): 50 Ω – BN 39591-2/50, 60 Ω – /60, 75 Ω – /75. Conductor (for BN 39592/.): 50 Ω – BN 39592-2/50, 60 Ω – /60, 75 Ω – /75.

Calibrated Adjustable Short. Waveguide cross section WR 90 for the range 8200 to 12,400 Mc. Direct short circuit. Short-circuit travel 0 to 50 mm. Micrometer drive. Accuracy of plunger setting ± 0.01 mm. Connection flange UG-39/U. ► Order Number BN 39611/90.

UHF Line Stretcher

Frequency range: 470 to 2400 Mc. VSWR: 1.1. Electrical length: telescoped 110 cm, extended 143 cm. Input and output in a straight



line. 2 short-stroke connectors precision Dezifix B. Dimensions: telescoped 150 x 50 x 490 mm, extended 150 x 50 x 660 mm. ► Order Numbers: For 50 Ω – BN 3971/50, for 60 Ω – BN 3971/60.



Waveguide Clamps

A practical means for the rapid and secure mounting of waveguide components for measurements and tests. Mounting rod screws into both sides. ► Order Numbers: For cross section WR 90 – HZ 1/90, for cross section WR 137 – HZ 1/137, for cross section WR 159 – HZ 1/159; Stand for a/m clamps: HZ 1. For cross section WR 229 – HZ 2/229; Stand fitting for that clamp: HZ 2.

Castored Table

Extremely stable model with big rubber wheels. Especially suited for transporting heavy measuring instruments as well as for assembling mobile test setups. Dimensions: length of the table 66 cm, length with handles 79 cm, width 49 cm, height 78 cm. ► Order Number BN 98013.

Coaxial Patch Cords

Cables with two 13-mm plugs (DIN 47284)

13-mm Cable	50 cm	50 Ω	► BN 90515/50
13-mm Cable	50 cm	60 Ω	BN 90516/50
13-mm Cable	50 cm	75 Ω	BN 90517/50
13-mm Cable	100 cm	50 Ω	BN 90515/100
13-mm Cable	100 cm	60 Ω	BN 90516/100
13-mm Cable	100 cm	75 Ω	BN 90517/100

Cables with two RF plugs 4/13 DIN 47283

13-mm Cable	50 cm	75 Ω	► BN 90507/50
13-mm Cable	100 cm	75 Ω	BN 90507/100

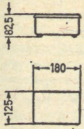
Cables with 2 short-stroke connectors Dezifix B (DIN 47285)

Dezifix Cable	50 cm	50 Ω	► BN 90555/50
Dezifix Cable	50 cm	60 Ω	BN 90536/50
Dezifix Cable	50 cm	75 Ω	BN 90557/50
Dezifix-Cable	100 cm	50 Ω	BN 90555/100
Dezifix-Cable	100 cm	60 Ω	BN 90536/100
Dezifix-Cable	100 cm	75 Ω	BN 90557/100

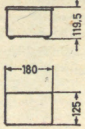
We reserve the right to make any departures from this specification, especially those considered desirable for reasons of improved design.

R&S STANDARD CABINETS

No. 14

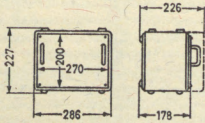


No. 15

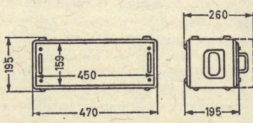


Excepting costum-made models, our measuring instruments are housed in strictly uniform standard-steel cabinets the most important of which are shown here as drawings to scale. The rugged cabinets feature rounded edges, a removable front cover and hinged carrying handles; the finish is light-grey lasting hammertone varnish (RAL 7001). After removal of the frontpanel screws the chassis can be withdrawn from the cabinet by the handles. Generally, the chassis of all R&S measuring instruments are readily usable for rack-mounting. The dimensions are given in millimetres!

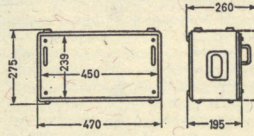
No. 35



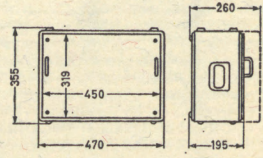
No. 45



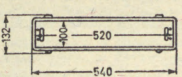
No. 46



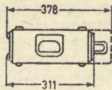
No. 47



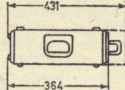
Nos. 53 & 531



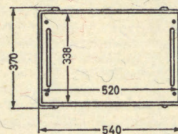
No. 53



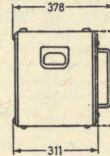
No. 531



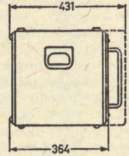
Nos. 510 & 5101



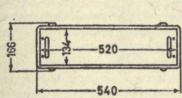
No. 510



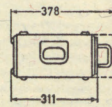
No. 5101



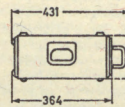
Nos. 54 & 541



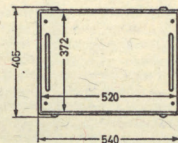
No. 54



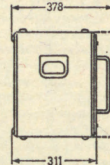
No. 541



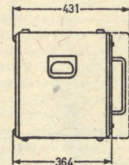
Nos. 511 & 5111



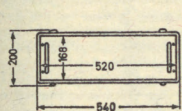
No. 511



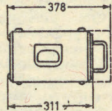
No. 5111



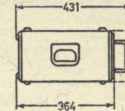
Nos. 55 & 551



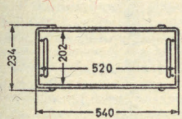
No. 55



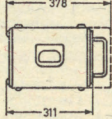
No. 551



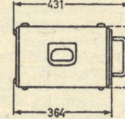
Nos. 56 & 561



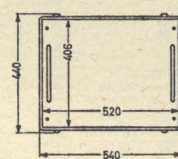
No. 56



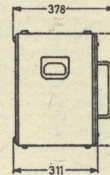
No. 561



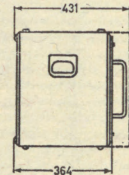
Nos. 512 & 5121



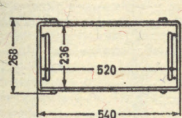
No. 512



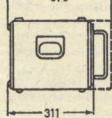
No. 5121



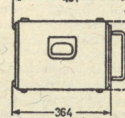
Nos. 57 & 571



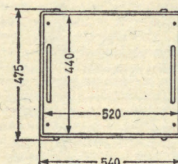
No. 57



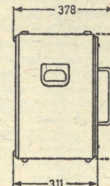
No. 571



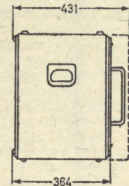
Nos. 513 & 5131



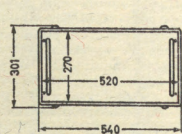
No. 513



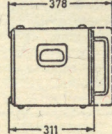
No. 5131



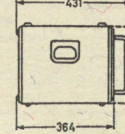
Nos. 58 & 581



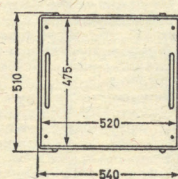
No. 58



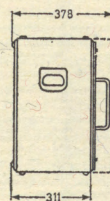
No. 581



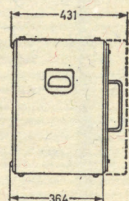
Nos. 514 & 5141



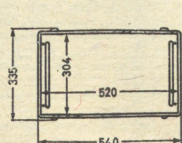
No. 514



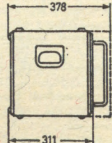
No. 5141



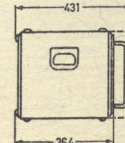
Nos. 59 & 591



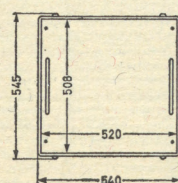
No. 59



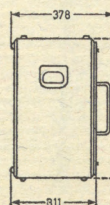
No. 591



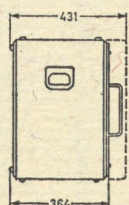
Nos. 515 & 5151



No. 515



No. 5151



R&S Standard cabinets are not sold separately!

R&S Addresses

ROHDE & SCHWARZ · MÜNCHEN 8 · MÜHLDOERFSTRASSE 15

Telephone 44 99 61 · Telex 05 23703 · Telegrams: rohdeschwarz münchen

DISTRIBUTORS IN GERMANY

ROHDE & SCHWARZ VERTRIEBS-GMBH

Berlin W 30
Augsburger Straße 40
Telephone 91 27 62
Telex 01 83 636

ROHDE & SCHWARZ VERTRIEBS-GMBH

Hamburg 39
Körnerstraße 34
Telephone 27 41 41
Telex 02 13 749

ROHDE & SCHWARZ VERTRIEBS-GMBH

Karlsruhe
Kriegsstraße 39
Telephone 2 52 02
Telex 07 82 730

ROHDE & SCHWARZ VERTRIEBS-GMBH

Köln
Hohe Straße 160-168
Telephone 23 30 06
Telex 08 88 2917

ROHDE & SCHWARZ VERTRIEBS-GMBH

München 2
Briener Straße 43
Telephone 59 52 66
Telex 05 22 953

EXPORT DISTRIBUTORS

Argentina	ECE Habana 3454 Buenos Aires	Telephone 53-2153
Australia	Electronic Industries Imports Pty. Ltd. Box 192 C, GPO Melbourne, C 1	FJ 4161
Austria	INGLOMARK, Markowitsch & Co. Mariahilferstr. 133 Vienna XV	547585
Belgium	ELECTRONIQUE GENERALE S.P.R.L. 14, Rue Père de Deken Brussels 4	352193
Brazil	Equipamentos Elétricos "NICAD" Ltda. Caixa Postal 2251 Rio de Janeiro	22-7812
Canada	The Ahearn and Soper Company Ltd. 850, Belfast Road Ottawa (Ontario)	CE 6-9441
Chile	IMPORTADORA Goldmann, Janssen y Cia. Ltda. Moneda 1158, 9º Piso Casilla 13570, correo 15 Santiago de Chile	62862
Columbia	Hanseatica P.O. Box 14467 Bogotá D.E.	437-890, 429-331
Costa Rica	see Guatemala	
Denmark	Tage Olsen AS Centrumsgaarden, Zi. 133 Vesterbrogade 6, D. Copenhagen V	Palac 1343
England	Aveley Electric Ltd. Ayrton Road, Aveley Industrial Estate South Ockendon, Essex	3444
Finland	Orbis Oy Etelä-Kaarela P.O. Box 2165 Kalannintie 52 Helsinki-Töölö	434239
France	Megex 105, Quai Branly Paris (15e)	SEG 36-93
Greece	E.T.E.K. Fthenakis-Soulis & Co., oH. P.O.B. 225 Chalkokondilis 19 Athens	55985
Guatemala	Electronica Guatemalteca Engel, Moller y Cia. Post Office Box 514 6a, Avenida 14-11 Zona 1 Guatemala City	5925
Holland	C.N. Rood N.V. Cort van der Lindenstraat 11-13 Rijswijk / (Z.H.) Postbus 4042	858300
Honduras	see Guatemala	
India	Toshniwal Bros. Ltd. 198 Janshedji Tata Road, Fort. Bombay 1	35952
Indonesia	Radio Corporation of Indonesia 55, Jalan Pos Utara Djakarta V/9	Gambir 3604
Ireland	AERSALES (Ireland) Ltd. "Maidenhead" Ballickmoyler Carlow	Ballylinan 10
Italy	Ing. Oscar Rojé Via T. Tasso, 7 Milan	432241

Japan	IMPEX CHEMICALS LTD. (Kenshin Yoko) Head Office, Osaka No: 25, Andojibashi-Dori 4 Chome, Minami-Ku Osaka	Telephone
Mexico	MYASA, Maquinaria y Accesorios, S.A. Apart. Postal 70, Av. Juanacatlan Nr. 15 Mexico 11, D.F.	15-44-11
Morocco	Etablissement Jean Brunot 8-10, Rue de la Somme Casablanca	283-86
New Zealand	Elekon (Overseas) Ltd. P.O.B. 5146 Auckland, C. 1	43-479
Nicaragua	see Guatemala	
Norway	Morgenstjerne & Co. PB. ST. H. 2613 Oslo	601790
Pakistan	Trade Linkers 46 Motan Bldg, Bunder Road Karachi 1	37145
Panama	see Guatemala	
Portugal	Soc. Com. Mattos Tavares Ltda. Rua dos Sapateiros, 39-2º Caixa Postal 2172 Lisbon	31101
Salvador	see Guatemala	
Senegal	Comptoir Technique Africain P.B. 1512 Dakar-A.O.E.	362-50
South Africa (Pretoria)	S.A. ELECTRO-MEDICAL 36-38 Trysa Buildings Andries Street Pretoria	2-7739
Southern Rhodesia	Philips Rhodesian (Pvt.) Ltd. P.O.B. 994 Salisbury	28196
Spain	"REMA" Leo Haag Plaza de Santo Domingo 16 Madrid	473825
Sweden	ROHDE & SCHWARZ, Svenska-Kontor Erstagatan 31 Stockholm SO	407041
Switzerland	W. F. Roschi Spitalgasse 30 Bern	37866
Turkey	Izzet Baraz P.O. Box 349 Galata Istanbul	222104
Uruguay	Octavio A. Quesada Canelones 1989 Casilla de Correo No: 311 Montevideo	43909
USA	ROHDE & SCHWARZ Sales Co. (USA) Inc. P.O. Box 275 111 Lexington Ave. Passaic, New Jersey	Prescott 3-8010
Venezuela	SERVICIO TECNICO INDUSTRIAL VENEZUELA Santa Eduvigis - 1 A. Avenida, Calle No. 6-Quinta IDA. Apartado 5061 Caracas	32.159
Yugoslavia	Jadran Moše Pijade 31/IV P.O. Box 917 Belgrade	28-994, 29-912







ROHDE & SCHWARZ · ELECTRONIC MEASURING INSTRUMENTS